EDITORIAL

Financing Next Year

"IT doesn't do to be too dogmatic about time sales terms. We are passing through a situation which we never have had before. The American public has in its hands more unpaid-for goods than at any previous time. Automobiles are being sold on more liberal terms than ever before. To a good many conservative bankers these terms look too liberal. But we must not be too dogmatic. When the business cycle gets into a depression period again we will *know* the answer. Until then we'll only be guessing."

The speaker was a well-known banker who is thoroughly familiar with the automotive industry in all of its branches. He is known as a conservative rather than as a radical in financial affairs. Yet he refused, even informally, to condemn out of hand the rather liberal financing terms which are being extended today. His conversation indicated very clearly, of course, that he would rather more conservative practices were being followed; that he recognizes the possibilities of serious future trouble. But he doesn't think any good end will be served by getting panicky.

And he probably is right. A good deal more attention should be paid to the retail credit terms to be granted during the next twelve months than to those already in process of liquidation. If plant expansion continues, there may be a strong temptation to car makers to push their dealers a little harder next winter than they did last. If that is the case, the pressure for even more liberal financing will grow. Then a downward turn in the general business cycle would mean difficulties all along the line. Careful consideration of the ultimate effect of every merchandising move made in the next twelve months will suffice to keep conditions sound.

Foreman Training

A REVIVAL of interest in foreman training is becoming apparent in some parts of the industry. The need for having foremen capable of handling the human and economic as well as the mechanical phases of their jobs is becoming increasingly apparent in automotive plants. Since most foremen are deficient to a greater or less extent as regards human and economic problems, the need for special training of some kind presses.

Foreman training is very definitely a problem which can be handled only by careful study on the part of individual factories. Cooperative courses may be feasible in certain places, but even in such instances actual work on the part of factory executives is needed.

Work of this kind cannot be turned over to outside agencies if the best results are to be obtained for the individual plant. The experience and methods found best in other organizations should be fully utilized, of course, in working out any new foreman training course, but the shifting of responsibility entirely outside the individual plant is almost certain to give the work an impersonality and a lack of specific values which will render it of minimum rather than of maximum usefulness.

The way in which such training is installed, moreover, often has a greater bearing on its success than the methods actually used. The interest and support of the foremen themselves is essential; without it the best methods will fail. Foreman training may be a means of bringing about better relationships between foremen and the particular factory for which they work; it may be the cause of friction. Both possibilities should be recognized and the latter should be guarded against.

It is well to remember that education is a leading out process, not primarily a driving in process. Foreman courses to be successful have to be based on a thorough understanding of the foreman's interests and desires, as well as on a knowledge of the facts the management deems it desirable for him to know.

Piston Displacement Increases

IT is interesting to watch developments in piston displacements in the passenger car field. On the whole displacements are a good deal smaller today than they were, say, ten years ago, this having been made possible by the great increase in piston speed. The interesting point in this connection is that reductions are made only when entirely new models are brought out. If a change is made in the displacement of a model that is merely undergoing development, it is always in the nature of an increase; we do not at the moment remember a single instance where the displacement of an established model was reduced.

The explanation for this seems to lie in the old conflict between "snap" and economy. When an engineer designs an entirely new car he often hopes to obtain all the power necessary from an engine of comparatively small displacement, by running it up to high speed, thus gaining advantages in the way of reduced cost, reduced weight and bulk and reduced fuel consumption. But the accelerating powers of cars are daily being put to the test on hills and when the traffic officer gives the signal to go, and the desire not to have their cars lag behind in these contests seems to be the chief reason for the increases in displacement which have been rather frequent of late. The American driver insists on plenty of power.

Our Industry Today

New Models and Price Reductions Attract Bargain Hunters to Automobile Salesrooms — Production at Peak

NEW YORK, Aug. 20—Bargain hunters are thronging the automobile salesrooms these days. The wave of price cutting has undoubtedly stimulated business, and with the lower prices in most instances have come new models in attractive colors and body designs well calculated to catch the fancy of the prospective purchaser.

Both production and sales are running at the highest level of the industry for this time of year. There has been little, if any, over-production so far, and dealers' stocks are in excellent condition, with some of them complaining of inability to obtain sufficient numbers of the new cars. The used car situation is not quite so favorable, since lower prices on the new models have had the effect of making the used cars harder to dispose of without reductions.

Bus and truck manufacturers are in even better condition than the car makers, since the demand for their products has been so great there was no need for price cuts. Parts and accessories manufacturers are sharing in the general prosperity, a compilation by AUTOMOTIVE INDUSTRIES showing that profits in this end of the business increased in the first six months of 1925 an average of 89 per cent over the corresponding period of last year.

Profits for car manufacturers are not likely to be as great during the last half of the year as they were in the first, as they are now feeling perhaps the fiercest competition they have ever known. The price cuts, however, are not as damaging financially as they might appear, as notable economies in production have been introduced in most instances. The feeling is that no further reductions will be made, except in two or three possible cases.

A great deal of attention is being directed to foreign sales, as opportunities for the export of American cars were never better. Cuba has launched a $300,000,000 road building project that should mean large sales of American cars. Germany has abandoned its restrictions on the import of automobiles, which limited manufacturers to four cars a month, and replaced them with a tariff which, while high, will permit American makers to compete.

DENY AGA NEGOTIATIONS

NEW YORK, Aug. 20—Rumors in the financial district that an American automobile company is negotiating for control of the Aga Motor Works, Germany, the Stinnes property that has lately been in difficulties, could not be confirmed. General Motors officials specifically denied that their company was interested in the reported deal.

Dodge and Hudson Announce Price Cuts

First Reduces from $10 to $60— Second from $55 to $100

DETROIT, Aug. 20—Owing to increased production Dodge Bros., Inc., have reduced prices from $10 to $60 on all models except the roadster and chassis.

The new prices are as follows:

	Old Price	New Price
Touring	$885	$875
Coupe	995	960
Sedan "A"	1,245	1,195
Sedan "B"	1,095	1,045
Coach	1,095	1,035
Special model touring	985	975
Coupe special model	1,095	1,060
Sedan "A" special model	1,330	1,280
Sedan "B" special model	1,195	1,145
Coach special model	1,195	1,135

New prices on the Panel Commercial are $960 and on the Screen Commercial, $885.

Hudson Prices Are Cut

DETROIT, Aug. 20—Lower prices for Hudson cars became effective yesterday. The list announced by the Hudson Motor Car Co. was as follows:

	Old Price	New Price
Hudson Coach	$1,250	$1,195
Essex Coach	850	795
Hudson Brougham	1,595	1,495
Hudson Sedan	1,795	1,695

397,094 July Output of Cars and Trucks

WASHINGTON, Aug. 20—July production of motor vehicles totaled 397,094,- a new high record for the month. This compares with 402,848 in June, 1925, and 270,935 in July, 1924. The figures are for the United States and Canada, trucks included. July passenger car output was 357,883 and truck output 39,211, a gain over June for commercial vehicles, when the figure was 38,042.

The total production for the first seven months of the current year, it is shown by the Department of Commerce figures, was 2,570,610.

AMERICAN BAR IN PARIS SHOWROOMS

PARIS, Aug. 12 *(by mail)*—M. Baehr, who holds the Chrysler concession for France, is completing an automobile exhibition hall at a cost of 8,000,000 francs. In the main hall he is fitting out an old-fashioned American bar, a concession unlike anything in any American show of recent years.

The hall has floor space 200 by 165 feet, with roof lighting and no pillars. On the roof are four inclosed tennis courts with rubber floors. Offices surround the main hall. There is a gallery for storage, shower baths and private salons. The hall will be available for the showing of all makes of cars.

Sees Problems in Parts Sales Abroad

Heminway Finds That Satisfactory Trade Volume Will Be Hard to Reach

NEW YORK, Aug. 20—Greater adaptability of American merchandise and methods to conditions and customs abroad is essential to extensive development of American automotive business in Europe, in the opinion of M. L. Heminway, general manager of the Motor and Accessory Manufacturers Association, who has just returned from a two months' business tour of England and the Continent.

Mr. Heminway gained the impression abroad that American car manufacturers have been too insistent on selling what they wanted to sell and must give more consideration to the needs and wishes of foreign buyers if they are going to bring about a permanent enlargement of their business in European countries. He believes that because of the comparatively small number yet large variety of makes and models of cars in operation in Europe and also because of European competition it will be difficult for American makers of original and replacement parts to develop great volumes of business in European markets. The same conditions, with some modifications, apply to accessory sales abroad, in Mr. Heminway's opinion, but he regards the market for American-made maintenance equipment as decidedly favorable, with very little European competition and with the need

(*Continued on page* 313)

Yellow Cab Merger Effective Sept. 1

Stockholders Approve Operation of Truck Division of General Motors

CHICAGO, Aug. 20—Announcement has been made by John Hertz that operation of the Yellow Cab Manufacturing Co. and the truck division of General Motors Corp. under the name of the Yellow Truck & Coach Manufacturing Co. will be effective Sept. 1. Hertz will be chairman of the board of directors of the new company.

Stockholders representing 490,000 shares of the 600,000 shares of the Yellow Cab Manufacturing Co. stock outstanding, voted for the merger which was negotiated by Hertz.

The truck division of General Motors will be acquired by Yellow Cab Manufacturing Co. through stock ownership of 800,000 shares of the Yellow Cab stock, par value at $10 a share. The truck business which is being taken over was valued at $16,000,000 on April 30, 1925.

Meeting in Portland, Me., stockholders also have authorized the board to issue and distribute 150,000 shares of preferred stock, par value at $15,000,000, to be paid as a stock dividend pro-rata to holders of the 600,000 shares of Class B stock of the Yellow Cab Manufacturing Co.

The board of directors will be increased from thirteen to twenty-one. A change was authorized in the capital stock by retiring $675,000 Class A stock and by adding 200,000 shares of preferred stock of the par value of $100 a share and 1,000,000 shares of common stock of the par value of $10 a share.

General Motors Truck Corp.

WILMINGTON, Aug. 20—The General Motor Truck Corp. filed articles of incorporation under the laws of Delaware with a capital of 160,000 shares, par $100. The incorporation of this company was one of the legal steps in connestion with the Yellow Cab Manufacturing merger.

ORGANIZE TUBE COMPANY

YOUNGSTOWN, OHIO, Aug. 20—R. A. Kenworthy and associates have organized the Falls Steel Tube & Manufacturing Co. to engage in the production of welded steel tubing in commercial gages, diameters and sizes, with a plant at Newton Falls, Trumbull County. The company will cater especially to the automobile industry, as its product will consist principally of small-sized tubing such as is employed in automobile building. Mr. Kenworthy has a wide acquaintance in the automobile industry in Detroit, as he was formerly connected as secretary with the Newton Steel Co., Youngstown, manufacturing full finished sheets used in auto body construction.

U. S. WATCHES ROAD BUILDING ABROAD

WASHINGTON, Aug. 20.—Through the newly created Highway Section in the transportation division of the Bureau of Foreign and Domestic Commerce, automotive manufacturers will be able to keep in close contact with road development abroad and be forewarned of the sections which will logically import more automobiles because of improved road conditions.

The work of this section, which is to be under the general supervision of Eugene E. Gregg, chief of the transportation division, commenced this week. Requests have been sent to counsels, trade commissioners, commercial attaches and other Government representatives stationed throughout the world to make periodic reports on status of highways in their particular areas, projects for extension and other matters having a bearing on these subjects. A survey of market possibilities for the sale of road building machinery through the world is also contemplated.

British Labor Party Acts Against Free Trade

LONDON, Aug. 13 (*by mail*)—At a representative Labor party meeting it has been decided to drop the free trade policy and adopt protection. Philip Snowden, who as chancellor was responsible for the abolition of the McKenna duties last August, was in the chair.

The view is taken that British workers should not be asked to compete with goods manufactured abroad under conditions of labor falling below the standard set by the Washington Convention.

With the Conservative party already supporters of protection, and the improbability of the Liberal party ever again becoming strong enough to take up the reins of power, it now appears that Great Britain will, for a long time at least, maintain a tariff on automobiles.

Road Builders Propose U. S. Good Roads Week

CHICAGO, Aug. 20—The American Road Builders' Association, beginning next January, is planning to tie up its annual meeting with a "Good Roads Week" to be observed throughout the country. The week of Jan. 11 has been selected as the first "Good Roads Week" and at that time exercises will be held in the public schools, and civic clubs also will hold special meetings.

At the same time the Annual Convention of the American Road Builders' Association will be in progress in Chicago.

Willys Sees Motor Progress Abroad

Says Europeans Are Taking American View That Car Is Not Luxury

NEW YORK, Aug. 19—John N. Willys, chairman of the foreign trade committee of the National Automobile Chamber of Commerce, and M. L. Heminway, general manager of the Motor and Accessory Manufacturers Association, returned from Europe this week with a generally cheerful view of conditions and prospects. Mr. Willys said:

"It is my observation that Europe is now on the verge of a similar motor development to that which the United States experienced in the past ten years. The people want to ride.

"In conversations with public officials abroad, it was apparent that their point of view, which has regarded the automobile as a luxury, is rapidly shifting, and that they recognize the desire on the part of the mass of the people that motor travel shall be encouraged.

"As a result there is a tendency toward more favorable tariff arrangements and taxation on a sound basis—rather than the punitive levies which now exist in many countries.

"Germany, industrially alert, is grasping the significance of motor transport and is planning to encourage this mode of travel as far as possible.

"American automobile plants will, I believe, in a short time double the proportion of their output going to the foreign field. In a few years 25 per cent of our production will be sold abroad."

New Dodge Commercial Assures Driver Comfort

DETROIT, MICH., Aug. 20—Driver comfort has received particular attention in the design of the new closed cab Dodge Brothers commercial car. The seats are upholstered like those in a passenger car with coil springs, padding and covered with leather. The cab, which is all steel, is roomy and the controls are easy to reach and operate.

A tray or shelf is provided above the windshield where the driver may carry order books, gloves, etc. The side windows are operated by crank regulators and the windshield is of the full ventilating type. The spare tire carrier is mounted under the rear of the body leaving the full side panel available for advertising.

MOON IN TAXI SERVICE

WASHINGTON, Aug. 17—Trading as the Blue Wren Sedan Service, a new taxi companay is commencing in Melbourne, Australia, with a fleet of Moon De Luxe sedans, says a consular dispatch to the Bureau of Foreign and Domestic Commerce. The object of the company is to operate a type of car more in keeping with the private sedans.

Sees Demand for U. S. Trucks Abroad

Col. Arthur Hacking, of London, Is Guest of John M. Willys in Toledo

TOLEDO, Aug. 20—That the coming market for commercial cars in the British Isles furnishes a greater opportunity for American manufacturers than the passenger car market was the opinion expressed here by Col. Arthur Hacking, secretary of the Motor Manufacturers' & Traders' society of London, at a luncheon tendered him at the Toledo Club last Thursday by John N. Willys, president of the Willys-Overland Co.

Sir William Letts, managing director of Willys-Overland-Crossley, Ltd., and other Overland officials were present.

Hacking declared that tariff restrictions and the specifications demanded by the British public differing as they do so much from American types were against the development of trade in those lines but left almost an open field for the commercial car.

He visited the Willys-Overland plant while here. Marvelous roads of the midwestern states and labor-saving machinery in automobile plants were two of the things Col. Hacking was most impressed with on his trip.

Hannum Steering Gear Ready for Production

MILWAUKEE, Aug. 20—Actual production within ninety days of the Hannum steering gears is announced by George H. Hannum, president and general manager of the newly reorganized Hannum Manufacturing Co. of Milwaukee.

The Hannum Manufacturing Co. has taken over the property of the Lavine Gear Co. In addition to continuing to service all former products of the Lavine Gear Co., the Hannum Manufacturing Co. is engaged in rearranging its factory and machinery for the production of the Hannum gear, a gear especially designed to take care of the additional demands of balloon tires upon the steering assembly. Sample gears are on the roads in a considerable number of test cars in several of the leading automobile plants, and definite commitments are already in hand to take care of immediate production.

The present plans are being so worked out that additional factory space on the adjacent land to the present plant can be swung into production without interfering with the present factory.

The officers of the new organization are as follows: George H. Hannum, president and general manager; T. R. Johnson, vice-president and sales manager; Herman Uihlein, chairman of the board; Arthur Westfall, secretary and treasurer; and Arthur Groth, assistant secretary and treasurer.

NEW YORK'S "FINEST" HAVE FORD SCHOOL

NEW YORK, Aug. 20—To give the motorized police of New York City an intimate knowledge of the construction and operation of the 722 Ford cars recently purchased by the city, a special Ford school has been established by the New York Police Academy.

More than 2800 police sergeants and patrolmen detailed to the motor division are enrolled in the Ford school in a course which covers completely every phase of the Ford engine, electrical, clutch and drive system. .

BRITISH OFFICIAL DUE

NEW YORK, Aug. 20—Sir Henry W. Maybury, British Minister of Transport, is due here on the Cunarder Franconia about Aug. 23. He will study American road systems, with particular reference to methods of construction. A delegation of automobile men will meet him at the pier and a lunch or dinner is to be given in his honor in a week or two, by the National Automobile Chamber of Commerce.

Goodyear to Construct Addition at $750,000

AKRON, OHIO, Aug. 20—Goodyear Tire & Rubber Co. joined this week the ranks of Akron rubber companies which have under way or contemplate the erection of new buildings to take care of increased business.

Officials of the company announce that construction of a new factory building, five stories high, will be started soon at an estimated cost of $750,000. The building will contain 198,580 square feet of floor space.

STUDY RUBBER CONSUMPTION

WASHINGTON, Aug. 19.—The Department of Commerce is making a survey of the consumption of crude rubber in this country during the first seven months of 1925. The first returns are insufficient to form the basis for a definite conclusion, but indicate that consumption has not decreased in spite of the high cost of rubber.

SEES BUENOS AIRES GAIN

PHILADELPHIA, Aug. 20—Paul R. Harper of Harper & Harper, Hupmobile distributors, who recently returned from Buenos Aires, predicts that from 70,000 to 100,000 new cars will be sold in that city during the next year. He adds that rapid growth in automobile sales there is having its effect, part of which is seen in the widening of the streets and in traffic rules barring horse-drawn vehicles from certain streets. About 95 per cent of all cars sold in Argentina, he says, are of American make.

Firestone Leases Rubber Plantation

Closes Deal with Liberia for Million Acre Production Tract in Africa

AKRON, OHIO, Aug. 19—Harvey S. Firestone, president of the Firestone Tire and Rubber Co., virtually completed negotiations today with the Liberian Government for the leasing of 1,000,000 acres of rubber plantation land in the African Republic.

Edwin Barclay, Secretary of State of Liberia, was in Akron to work out final details of the transactions. He arranged for a long time lease on the property. This is expected to be approved as soon as he returns to that country.

After receiving assurance from Secretary Barclay that officials of Liberia were ready to approve his proposition, Mr. Firestone announced that he will place under cultivation the entire million acre tract. He is planning to send a large force of men there to prepare the land for growing rubber trees. This marks the first effort of an American manufacturer to grow rubber on such a large scale, although the question has been agitated for years.

To Form Company

It is learned on good authority here that a $100,000,000 corporation will shortly be formed to operate the Liberian plantation on a gigantic scale, which will assure American manufacturers of an adequate future supply of rubber. Mr. Firestone predicts that Akron will not only be the center of the manufacturing world, but will become also the headquarters of the rubber growing industry of America. This would be brought about, he indicated, through the formation of a mammoth corporation, designed to grow rubber in foreign countries, financed by American capital.

French Production for 1925 Showing Increase

PARIS, Aug. 12 (*by mail*)—An increase of about 20 per cent in French automobile production this year, compared with 1924, may be expected if the average is maintained during the next five months. Although there are no official figures, last year's French production was estimated at 170,000 cars. April, May and June were particularly good months for both home and export business, while the output during July, although lower than that of June, has been equal to last year. There are very few firms not having increased production, those particularly having made progress being Renault, Donnet-Zedal, Peugeot, Mathis, Talbot, Delage and Hotchkiss. The greatest volume of business has been done in small cars of 10 horsepower (European rating), or 91 cubic inch piston displacement, or less.

N.A.D.A. Will Hold 21 Sales Meetings

Series Scheduled for September—Points Chosen Mainly in East

ST. LOUIS, Aug. 19—A series of sales congresses is to be conducted by the National Automobile Dealers' Association during September. The dates given out for the various cities in the first announcement are:

Des Moines, Iowa, Sept. 9; Peoria, Ill., Sept. 10; Ft. Wayne, Ind., Sept. 11; Buffalo, N. Y., Sept. 14; Lockport, Niagara Falls, Sept. 15; Batavia, Canandaigua, Sept. 16; Rochester, Sept. 17; Syracuse, Sept. 18; Utica, Schenectady, Sept. 21; Albany, Sept. 22; Poughkeepsie, Kingston, Sept. 23; New York, Sept. 24; Brooklyn, Sept. 25; New Haven, Bridgeport, Sept. 28; Hartford, Sept. 29; Boston, Sept. 30.

Sales plans, used car plans and dealer profits will be discussed in all the programs, all of which will be identical, so far as topics to be discussed are concerned.

Under the head of sales plans, national authorities will discuss the best methods for training salesmen to follow definite sales plans and how successful sales plans are built and developed. Market analysis from the standpoint of successful methods used by prosperous dealers and distributors also will be discussed.

Used Car Losses

Automobile dealers throughout the country lost 8.2 cents for every dollar of car sales on used cars during 1924. This was about one cent less than the losses in 1923. N. A. D. A. has conducted a campaign of education on the used car situation for four years which has been largely responsible for the reduction in used car losses. In 1922 dealers throughout the country lost $126,000,000 on used cars and in 1924 they lost $40,000,000. How this great reduction in used car losses was brought about and what plans are afoot to still further reduce losses will be discussed at the forthcoming sales congresses.

Some Details Incomplete

How successful dealers are able to make 5 per cent net profit will be another interesting item on the programs.

Speakers and details of the various programs have not as yet been announced. Committees in charge of the arrangements are preparing for one of the most interesting series of conferences ever held.

All the congresses are being arranged in cooperation with local associations and dealer committees. Dealers who wish to attend are urged to see the president or secretary of their local associations for information concerning the time and place of the meeting in their vicinity.

SEES FEWER TRAIN STOPS WITH BUSES

DALLAS, TEX., Aug. 17—It is the opinion of J. L. Lancaster of Dallas, president of the Texas & Pacific Railroad, that buses and motor trucks are here to stay.

"Automobile buses are filling a niche in the nation's transportation system which is their own and from which the railroads never can drive them," Mr. Lancaster said. "Luxurious parlor cars are being made for transporting passengers over the highways and powerful trucks for freight hauls.

"The buses, by eliminating the distance factor, also will enable the railroads to start the movement which today has not been begun, that is, making stations more infrequent. There is no reason for having a depot every two and one-half to five miles, for ten miles is only a little farther away by automobile. The railroads, by taking out stations, will save the cost of maintenance, which is fixed in busy and dull periods alike, and obviate the cost of trains stopping so frequently."

Beha Again Postpones Hearing for Chrysler

NEW YORK, Aug. 20—State Superintendent of Insurance Beha on Aug. 17 postponed for the third time the hearing on his order to the Palmetto Fire Insurance Co., to show cause why its license should not be revoked in New York State. The Palmetto company is handling insurance for the Chrysler Corp.

Answering Beha's original order the Palmetto obtained a temporary injunction requiring the superintendent to show cause why it should not become permanent to restrain him from interfering with the business. A hearing was held on this move last week before Judges John C. Knox and Augustus Hand, of the U. S. District Court, and Judge Wade Rogers of the Circuit Court of Appeals. Decision was reserved.

Superintendent Beha fixed the date for the hearing for Aug. 27, in his offices in New York City.

NEW MARMON EQUIPMENT

INDIANAPOLIS, Aug. 19—Nordyke & Marmon Co. announces that it has added considerable equipment and refinement to its five-passenger phaeton and to its seven-passenger touring car, and raised the prices of each of these open vehicles to $3,295, the same price as the vehicles in the standard closed car lines. Among the equipment and accessories added to the phaeton and touring cars are fender mirrors, top boot, tonneau cover or boot, and nickeled rear vision mirrors.

Stinnes Hard Hit With Payroll Due

Offers Aga Motor Works Employees $500,000 in Company Stock

BERLIN, Aug. 12 (*by mail*)—Edmund Stinnes, oldest son of the late Hugo Stinnes, has found it impossible to meet the payroll of the Aga Motor Works, in Berlin, requiring 100,000 marks. The plant employs 2000 persons and is reported to be on the verge of a shutdown. Stinnes is said to have asked the Prussian government for 3,000,000 marks credit. The tie-up of money is the result of a controversy between Stinnes and the Berlin banks. The Aga plant builds a small type of automobile which has a good market in Germany. Production averaged 500 cars a month.

Stinnes offered to present the workers with shares in the company valued at approximately $500,000, or the equivalent of $250 each. It is understood however, that the communistic faction urged rejection of the offer on the grounds that the assets are 9,000,000 marks and the liabilities 12,000,000.

They point to the situation between Edmund Stinnes and the German banks which are liquidating the late Hugo Stinnes' fortune and contend that the automobile manufacturer hopes to share his fall with the workers. Edmund has refused to pool his resources with those of his brother, Hugo, to which the banking consortium strenuously objects.

Reports are conflicting regarding the manufacturer's attempt to borrow money for the payroll. In some sources it was said that he had succeeded in acquiring 100,000 marks from the Reichsbank. Others asserted that until the workers make a final determination on the stock offer the payroll remained partly unmet.

BENDIX BRAKE EXPANDS

INDIANAPOLIS, Aug. 20—Plans are under way by the Bendix Brake Co., South Bend, Ind., manufacturer of automobile brake equipment, for enlargements and the installation of additional machinery to give employment to more than 200 extra men. The company is a subsidiary of the Bendix Corp., Chicago, Vincent Bendix, president.

The new plant to be erected by the Indianapolis Pump & Tube Co. of this city.

OFFER TO FORD BRINGS BID

BOSTON, Aug. 19—New York and Boston interests have bid $700,000 for the Victory plant at Squantum on Boston Harbor, after attempts were made to interest Henry Ford in the property. It is understood the purchasers will manufacture steel products and will employ about 2000 men. The bid is $350,000 higher than any previous offer.

Metal Market Fears Period of Inflation

Automotive Consumers Bear Burden of Price Cuts and Buying Is Light

NEW YORK, Aug. 20—Unnaturally high prices for lead; the turn in the copper market, although long expected; a continuance of levels in the tin market that offer little comfort to the consumer, all of these conditions together with the uncertainty over the outlook in the coal mining industry have revived in many quarters fears of another period of inflation in the metal markets generally, and this in spite of the fact that iron and steel continue to act in a drowsy manner with prices rather flabby.

There has been so prolonged a pause in representative buying in the steel market, argue those who profess to see a decisive change approaching, that when worth-while demand begins to reassert itself, the effect will be far more keenly felt than it would be if the transition were a more gradual one. Two factors combine to exert a paramount influence on the price of every steel product.

Expect Rail Orders

First, there is the demand for the product itself. If automotive consumers are out of the strip or sheet markets, prices suffer because automotive consumption has come to be their main prop. The demand for steel in general, however, be it rails, structural shapes or a commodity so far remote from automotive interest as, for instance, ship plates, is the second factor of influence. There are those who are convinced that the railroads which of late have been out of the steel market will bob up with spectacular orders as soon as a revival in the general industrial demand for steel is noticeable, and that this railroad buying will be the Pelion that will be piled on the Ossa of a seasonably improved general industrial demand for steel, thus giving sellers once more command of the market.

As against this possibility, automotive consumers declare that the steel producers from whom they buy are fully aware of the burden which cuts in passenger motor vehicle prices have placed upon them, and that higher price levels for raw materials are more out of the question than ever before. Certain it is that in many lines of manufacture, other than automotive, which have virtually been out of the steel market for some time, the first advance in prices would be the signal for buying on a larger scale, and, dull and uninteresting as the market seems at this time, astute buyers are watching keenly every development. About the only development to report is that the price for cold-finished steel bars has receded to 2.50c, Pitts-

(*Continued on page* 317)

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Aug. 20—Some moderate increases in rates of industrial production were noted last week, while wholesale trade felt the stimulus of the approaching fall season. The upward movement of stock prices continued, although considerable irregularity was apparent. A downward reaction in general commodity prices followed several weeks of advance. Crop weather was favorable, especially in corn and cotton districts where rain was badly needed.

Car loadings passed the million mark for the third time this year in the week ended Aug. 1, when the total was 1,043,063, as against 1,029,603 in the preceding week and 945,613 in the corresponding period last year. All classes of freight were loaded in greater volume than a year ago, with the exception of grain.

Employment in manufacturing industries reporting to the Department of Labor declined 1.1 per cent last month. Aggregate earnings of employees decreased 2.4 per cent and per capita earnings 1.3 per cent. July closings and vacations are held largely accountable for the decreases, which are much smaller than those of a year ago.

Consumption of lint cotton last month amounted to 483,898 bales, comparing with 493,765 bales in June and 347,099 in July, 1924. Total consumption for the cotton year ended July 31 was 6,191,349 bales, as against 5,680,554 in the preceding year.

Building contracts in 36 States last month, as reported to F. W. Dodge Corporation, had a total value of $529,000,000, the highest July figure ever recorded and the highest of all time with the exception of the totals for April and June of this year. Last month's figure is 53 per cent larger than that for July, 1924.

Bank debits to individual accounts reported to the Federal Reserve Board for the week ended Aug. 12 are 9.4 per cent smaller than the total for the preceding week, but 9.8 per cent above that of a year ago.

Fisher's index of wholesale commodity prices stood at 160.6 last week, as compared with 161.4 in the preceding week and 160.5 four weeks earlier.

Earnings assets of the Federal Reserve banks declined $10,900,000 during the week ended Aug. 12, with declines of $5,700,000 in discounts, $300,000 in open market purchases and $4,900,000 in holdings of Government securities. The circulation of Federal Reserve notes increased $12,100,000, while total deposits decreased $29,700,000 and total reserves $3,600,000. The reserve ratio rose from 75.3 to 75.5 per cent.

July Gains Over June for M. A. M. A.

Survey of Business Conditions Indicates Advance Is General in All Lines

NEW YORK, Aug. 20—July was a slightly bigger month than June for makers of automotive parts, accessories and maintenance equipment, according to the regular monthly survey of business conditions just announced by Neal G. Adair, manager of the educational department of the Motor and Accessory Manufacturers' Association. The wholesale value of shipments during July was represented by an index figure of 159, as compared with 158 in June.

Detailed figures for the separate divisions of the industry, contained in the M. A. M. A. Business Bulletin for August, showed July shipments of units, parts and accessory makers to car and truck manufacturers at an index figure of 165 for July, as compared with 164 for June. In shipments to the wholesale and retail trade the replacement parts index figure was 152, as compared with 129 in June, the accessories figure was 149, as compared with 172 for June, and the maintenance equipment figure was 113, as compared with 159 for June.

Replacements Heavy

Replacement parts shipments in July were the heaviest of any month during the year, the previous peak having been in May, with an index figure of 134. Heavy touring reported from all parts of the country, together with the ready market and consequent demand for reconditioning of used cars, were factors in the record breaking replacement parts business.

The recession in sales of accessories and maintenance equipment to the trade was normal, the spring months always being the busiest in these lines, when wholesalers, retailers and service men are putting in stocks and equipment for the peak business of late spring and summer.

The slight gain over June in July shipments of original equipment to motor vehicle makers was in anticipation of the speeding up of passenger car production in August, well under way under stimulation of numerous new models and reduced prices.

The M. A. M. A. index figures were based on the wholesale value of shipments to customers by a large number of representative manufacturers, these shipments for July aggregating nearly $17,000,000, as compared with approximately $10,500,000 in January, representing the basic index figure of 100. The largest individual manufacturer's shipments in July aggregated more than $2,000,000.

Members of the M. A. M. A. reported their plants operating in July at an

(*Continued on page* 313)

Sees Problems in Parts Sales Abroad

(*Continued from page* 308)

of adequate service facilities rapidly becoming more generally recognized among the foreign trade.

Obstacles Not Serious

Mr. Heminway said he did not believe there were any serious obstacles to a considerable expansion of American automotive business in Europe, but he said that careful study of the possibilities and development of business along lines that would meet the demands of foreign customers would be necessary. European competition has now reached a point, he believes, when it can be met only through sales planning on the part of American manufacturers.

Commenting on the trip Mr. Heminway said:

More cars will be sold this year than last year and of these the large majority will be of the low or medium priced class. Outside of England and France our cars are preferred to the foreign, but in those two countries the French, English and Italian cars are making rapid headway. Some of our lower priced cars are losing ground there very rapidly and none can maintain even their present prestige, in my opinion, unless more consideration is paid to the needs and wishes of the foreign buyers. In other words, the small six-cylinder car with low horsepower rating, built along snappy lines and made in their own factories is strongly favored.

The outlook for the manufacturers of parts and accessories is not as bright as that of the car builders for several reasons.

Competition a Factor

First, the makers of parts for original equipment face the difficulty of supplying comparatively small quantities from great distances, against close price competition from nearby manufacturers. The foreign car manufacturer who is in position to place orders large enough to attract us either makes his own units or has them made near home on a basis which is not affected by our quotations of slightly lower prices. Those American manufacturers who have established factories abroad are in position to compete successfully with the foreign makers, but the available volume of business on most units is insufficient to justify the expense of such a policy by many of our unit makers.

Martin L. Heminway

Second, the large variety of models and makes of cars now rolling makes the replacement parts field unattractive. Those of our cars abroad which are sold in quantities are generally self contained and replacement parts are supplied by the car builders.

Third, American accessories seen on cars abroad generally have been sold as original equipment. There are comparatively few lines of accessories which can be readily adapted to the many varieties and types of cars now in use abroad. Therefore, as the probable volume is small, compared with domestic possibilities, there is little incentive to the American manufacturer to expend the necessary time and money to secure it.

While this may sound somewhat pessimistic it is not so intended, as it is merely a reflection of my impression of existing conditions. I am a bull on the future, believing that motor transportation is just beginning to open up abroad. Our car builders are in position to take advantage of the development if they will but recognize the necessities of the situation. The parts and accessory makers will have their market broadened as the number of American cars in Europe increases.

Realize Service Need

There is also a growing realization of the importance of proper car servicing. Modern, up-to-date service stations are beginning to appear in the principal cities. This means an increased market for replacement parts and service equipment.

Our manufacturers who are not thoroughly familiar with conditions must realize that in order to compete successfully abroad, they must devote the same care and time to it that they do to the domestic field.

July Gains Over June for M. A. M. A.

(*Continued from page* 312)

average of 78 per cent of capacity as compared with an average of 83 per cent for the first six months of the year and 79 per cent at the end of June.

Automotive equipment wholesalers reported July business in excess of June and also greater than in July, 1924, in 12 out of 17 wholesale districts of the United States and Canada. In four districts declines were noted in the wholesale business in July as compared with both June of this year and July, 1924, and in one the volume was about the same.

The Week's Developments in Motor Stocks

NEW YORK, Aug. 20—The advance in stock prices on the New York Stock Exchange after having been arrested for a time was resumed during the current week. To what extent it represented a test of public sentiment on the part of professional operators and to what extent the experienced judgment of sober buyers is a question, which only the future can answer.

Mack Trucks has held the leadership of the motor group by its sensational advance of the past week. As in the case of American Can and General Electric, which also have soared to exceptionally high levels, the advance has all the air of mystery which Wall Street loves. Nothing has been made public which would warrant present selling prices of any of these stocks and so long as there is no positive knowledge speculation runs rife.

A rather significant movement occurred in International Harvester based upon reports of a great increase in its truck business. In this case it is pointed out that this Company probably has the smallest selling expense of any corporation engaged in the motor truck industry because its sales are made largely to farmers who purchase agricultural machinery from it. This is rather a far cry from such prosaic facts as net earnings and dividends but this is the season of the year and Wall Street is in the speculative frame of mind not to examine too closely its excuses for advocating an advance or decline in the price of a stock.

White Motors climbed to a new high as a result, it is understood, of the activity of a group of traders with which the management of the company has no connection.

Directors of the du Pont Co. declared a quarterly dividend of $2.00 per share on the common and an extra dividend of $1.00 per share. The predominant position occupied by the Du Pont interests in the motor industry through their control of General Motors Corp. was sufficient for this action to find reflection in substantial buying of General Motors stock. It will be recalled that last spring du Pont increased its dividend when General Motors advanced its rate, since when a stock dividend of 40 per cent has been declared. This action by the du Pont directors brought renewed predictions of another extra dividend of $1 per share by General Motors during the Fall and there are hints that this stock is to repeat, in due course, the sensational advances which have occurred in issues sponsored by the same banking group.

Elsewhere in the motor list there were few movements of importance. Gardner Motors and Chandler Motors both reflected the unfavorable interpretation which the speculative community has placed upon the market action of these stocks since the first of the year, but elsewhere prices have fluctuated according to the short interest outstanding or the overbought position. H. H. S.

A.E.A. Makes Plans For Annual Exhibit

Contracts Let for Chicago Show—Space to Be Assigned Sept. 24

CHICAGO, Aug. 20—Contracts have been sent out for the seventh annual exhibit of the Automotive Equipment Association, which will be held at the Coliseum in Chicago, Nov. 9 to 14 inclusive.

Assignment of space to the various applicants whose contracts have been accepted will be made at the Congress Hotel, Chicago, at 10 a. m., Sept. 24.

This year's A. E. A. show, which will be held in connection with the association's annual convention, will be conducted under practically the same rules as last year. The show is exclusively for the trade and admittance will be by ticket or invitation. Tickets are issued to all jobber members of the A. E. A. and their salesmen, and invitations will be sent to a selected list of automotive wholesalers outside the A. E. A. membership. This list has to have the approval of the association. The exhibitors will be the manufacturing members of the A. E. A.

This year a special effort is being made to have a large attendance of automotive distributors and wholesalers from foreign countries. About 1500 invitations were sent out to the trade in countries other than the United States and Canada early this summer. For several years there has been a growing interest in the A. E. A. show on the part of foreign automotive merchants, and it is the belief of the association members that this exhibit can be used to create a large export trade for automotive manufacturers.

Akron Rubber Factories Plan for More Space

AKRON, OHIO, Aug. 20—Announcement of new building plans by two of the leading rubber companies was made public here this week.

Contract for a new $350,000 warehouse has been awarded by the Firestone Tire & Rubber Co. It will consist of a basement and four stories, with about 200,000 sq. ft. of floor space. The building will be completed about Dec. 1.

The General Tire & Rubber Co. plans to increase its production by nearly 50 per cent next, as a result of larger factory space to be provided. Part of this will be accomplished by the erection of another wing adjoining the main plant. A permit has been issued to the same company for construction of a new heater room, to cost $50,000.

The B. F. Goodrich Co. expects to complete by November its $1,000,000 warehouse. It will be six stories high with 550,000 sq. ft. of floor space.

AUTOMOBILE FORCES ROADS FOR VENICE

VENICE, Aug. 12 (*by mail*)—Centuries of romantic isolation enjoyed by the city of Venice as an island probably will be soon ended, because the automobile has forced authorities to consider plans for a highway connecting Venice and Padua.

The gondolas have been the single means of travel between Venice and the rest of Italy, except the railroad, which crosses the lagoon on a pontoon bridge.

Definite plans for the highway have been completed and are in the hands of government authorities, who are responsible for a decision one way or another. Indications are that the road will be authorized.

High Speed Light Trucks for Chile and South Africa

SPRINGFIELD, OHIO, Aug. 19—Orders were booked during the last week by the Springfield works of the International Harvester Co. from Chile and South Africa for high-speed light motor trucks. About half of the new motor buses ordered by the Boston Elevated Railway Co. have been delivered, it is announced by local representatives of the Harvester company. These chassis for the others are being equipped with the new street-car type of bodies with pay-as-you-enter convenience. These buses are to be used to handle passengers in the rural districts of Boston.

NEW DUESENBERG ROADSTER

INDIANAPOLIS, Aug. 20—The Duesenberg Motors Corp. has just announced the addition of a four-passenger roadster to its straight eight line. The new model, the equipment of which is identical with that of the two-passenger roadster except for the addition of a rumble seat is mounted on the shorter, 134-inch, wheelbase. Prices will be furnished on application.

PLANS TRANSATLANTIC FLIGHT

NEW YORK, Aug. 20—Lieut. Georges Kirsch, a French flying ace, is aboard the Rochambeau, heading for New York to compete for the prize offered by Raymond Orteig for the first airman who flies from Paris to this city, or vice versa. The reward will be $25,000.

JOBBERS AT SALES MEETING

MILWAUKEE, Aug. 19—More than 150 jobbers from every part of the country were present at the annual sales conference of the Badger Rubber Works of Cudahy, Wis., on August 11-12.

New German Tariff Encourages Export

Rates Heaviest on Small Cars, But Allow Fair Competition Abroad

NEW YORK, Aug. 19—Details of the new German tariff on automobiles have reached export managers here, and analyses show that there is opportunity for a good export business to Germany under the arrangement which replaces the old licensing system.

The rates bear heaviest on the producers of low-priced cars, but even they will be able to place automobiles in Germany at approximately the same prices as are set by the small car manufacturers of Germany, averaging $1,100. The tariff on small American cars is about $500.

Tariff Is Graduated

The tariff was graduated so as to be reduced on the first day of January and July until after July, 1928. The rate in gold marks per 100 kilos on automobiles follows:

	Less than 2,200 kilos	2,200 to 3,200 kilos	More than 3,200 kilos
Beginning	250	175	150
July 1, 1926.....	216	160	135
January 1, 1927.	200	130	120
July 1, 1927.....	150	100	90
January 1, 1928.	100	75	70
July 1, 1928.....	75	40	30

The rates for the current year were effective Aug. 25.

Goodrich to Manufacture Tire Filler Inner Tubes

AKRON, OHIO, Aug. 20—A wide market is available for distribution of the so-called puncture proof, or "tire filler" inner tubes, according to officials of the B. F. Goodrich Co. The patents, manufacturing and sales rights of the tubes have just been purchased by Goodrich from the Rubber Ace Co. of Chicago. Equipment is now being installed at the Akron plant to manufacture them on a large scale. Distribution will be through regular Goodrich wholesalers and retail dealers.

The appeal, Goodrich sales executives state, will be largely to owners of light delivery trucks and other light motor vehicles, which require an uninterrupted service, assured by puncture proof tires. The inner tire, or tube, which was developed by the Rubber Ace group, is a semi-solid tire filler of sponge rubber. It is virtually an inner tube, consisting of thousands of tiny, air filled vesicules, and is said by Goodrich experts to compare favorably in resiliency with the ordinary pneumatic inner tube, and to have the added advantage of being blow-out and puncture proof.

Moray Describes Financing Plan

Hartford Accident & Indemnity Co. Head Explains New Automobile Project

HARTFORD, CONN., Aug. 19—Norman R. Moray, general manager of the Hartford Accident and Indemnity Co., has issued a statement regarding the "Hartford Automobile Purchase Plan," which first came to public attention last week in an announcement by Wirt, Wilson & Co., Hartford agents in Minneapolis.

The agent's statement follows:

If you contemplate buying a car (new or second-hand) you can go to the Hartford agents, Wirt, Wilson & Co., and procure the purchase price. Simply select the car you want and Hartford gives you the cash at a reasonable interest rate spread over monthly payments. You can then go to the automobile dealer and have all the advantage of being a cash buyer—for we give you the cash.

No "Red Tape" Involved

The fire and theft insurance, so essential to you, is also carried by the Hartford. In the event of any adjustment of losses you can know your interests are protected. If you wish additional car insurance—liability, property damage or collision—the cost may be spread over the monthly payments.

No red tape is involved in the transaction. You select your car and Hartford gives you the purchase price. The simplicity of the Hartford automobile purchase plan will appeal to your business sense as being extremely simple and clean cut. The car dealer himself cannot give you as good terms and insurance as included in the Hartford automobile purchase plan.

Moray's statement, in part, was as follows:

The Hartford so-called financing plan as reported in several of the morning papers is in the first place exclusively a matter of the Hartford Accident & Indemnity Co. and not of the Hartford Fire Insurance Co, but the Hartford Accident & Indemnity Co. does not finance the purchase of automobiles. The Hartford Accident & Indemnity Co., under its surety privileges, is entitled to guarantee financial transactions of practically any nature, and where a client of the Hartford Accident & Indemnity Co. of sufficient financial strength to warrant the Hartford Accident & Indemnity Co. guaranteeing his responsibility desires to enter into a contract to purchase an automobile, lease a building, pay freight charges or any other similar financial obligation, he can obtain a bond.

The question of fire, theft or any other insurance in connection with these transactions is merely incidental, excepting that if the risk involved is subject to destruction or loss by fire, theft, or other similar hazards, naturally the Hartford Accident & Indemnity Co. must have insurance against those hazards.

The Hartford Accident & Indemnity Co. does not put into the hands of all of its agents the right to guarantee financial obligations, and most of those transactions must be submitted to the home office in Hartford. But in some cities, among which is Minneapolis, where it has in its employ highly trained underwriting specialists, the company has given the privilege of writing bonds guaranteeing financial transactions within specified limits, and the guarantee that a man will fulfill his contract respecting the purchase of an automobile comes within those limits. One of the prerequisites, however, of such a guarantee is that the purchaser of the automobile will insure it in some standard company against the hazards of fire and theft, and the policy made payable to the purchaser of the car and the Hartford Accident & Indemnity Co. as their respective interests may appear.

1909 *PACKARD GOING AFTER* 500,000 *MILES*

WASHINGTON, Aug. 20—After 500,000 miles travel, a 1909 Packard is listed among the assets of an automobile mechanic in bankruptcy court here. He admits that he has changed tires.

Automobile Club experts figure that the car has averaged 85 miles a day for sixteen years, or the equivalent of twenty trips around the equator. The old machine will be sold to satisfy creditors at an appraised value of $25.

Report 100,000 Essex Cars Manufactured This Year

DETROIT, Aug. 19—Upward of 100,000 Essex cars have been manufactured so far in 1925, the first six cylinder car to attain that number, according to one of the Hudson officials, who also stated that this number was 15 per cent more than the entire number of Essex built during 1924.

With production on a volume basis it seems likely that the output for 1925 will see twice as many Essex cars built as for all of last year, despite the fact that 1924 was considered a remarkably successful Essex year.

Not only has the sale been phenomenal in the United States, but the demand also is brisk in Great Britain, the Continent and in the various colonial fields. In Canada the Essex sales have been almost twice as great as in this country according to the Dominion report.

TO MAKE STABILIZERS

SPRINGFIELD, OHIO, Aug. 20—Automobile stabilizers are to be manufactured by The Buckeye Incubator Co., of this city, about Sept. 1. The stabilizers will be made under another name, which has not been made public. J. B. Cartmell and others purchased the Westcott Motor Co. building a short time ago and will fill up the plant with small industries. Indications are that Receiver J. M. Rehe of the Westcott company will be able to close up the affairs of the concern in September. Orders for Westcott cars are being rapidly filled. So far no deal has been closed by which the Westcott car will be made here or elsewhere.

Production and Sales Are Heavy

Reports of Earnings and Outlook for Balance of Year Indicate Continued Prosperity

NEW YORK, Aug. 20—Reports from various automotive concerns received during the week indicate continued business health. Production and sales are heavy and in nearly every instance predictions for the balance of the year are sanguine. There seems to be a general belief that foreign trade is decidedly improving.

The following reports are significant:

Willys-Overland Profit

TOLEDO, Aug. 20—Preliminary statement of Willys-Overland Co., for six months ended June 30, 1925, shows net profit of approximately $10,500,000, after ordinary taxes, depreciation, interest, and expenses of new models, but before federal taxes. This is equal to $47.62 a share earned on $22,049,500 7 per cent preferred stock, and compares with $2,781,692 or $12.61 a share, in first half of 1924. Allowing only for regular 3½ per cent preferred dividend requirements, balance is equal to $4.29 a share (par $5) earned on 2,264,634 outstanding shares of common stock, against 88 cents a share in first half of 1924. Back dividends on preferred stock amount to 29¾ per cent.

Net profit for June quarter this year was approximately $7,328,000, equal to $33.24 a share on the preferred and $3.06 a share on common, after regular preferred dividend requirements. This compares with $3,171,466, or $14.38 a share on preferred and $1.23 a share on common in preceding quarter, and $621,172, or $2.81 a share on preferred in second quarter of 1924.

Hupp Sets July Record

DETROIT, Aug. 19—July sales of automobiles by the Hupp Motor Car Co. broke all previous records for the same period. According to O. C. Hutchinson, general sales manager, it was one of the three largest months in the history of the company. Compared to July, 1924, the sales of last month were 59 per cent higher, with the sales volume in dollars registering an even larger increase, due to the eight-cylinder car.

The records for the June and July sales of this year, Mr. Hutchinson said, were 76 per cent better than those for the same months last year.

Factory shipments of Hupmobile eights to distributors reached the highest total they have yet attained, surpassing the June record by 400 cars and doubling that of May. Heavy production is being maintained this month in an effort to catch up with the sales stimulus recently brought about by reductions at the beginning of the season.

(*Continued on page* 319)

N.A.D.A. Establishes Difficulty of Sale

Research Proves That Several Deals Are Necessary to Finish Transaction

NEW YORK, Aug. 20—Two, three and four sales are generally necessary for an automobile dealer to finish a transaction begun with the sale of a new car, according to studies that have been made by the National Automobile Dealers' Association, which corroborate a general belief held among dealers for some time. One exceptional case showed forty-seven transactions before the dealer was able to clear himself of his entire original investment in an old car he had accepted as part payment in the delivery of a new car.

In studies which the N. A. D. A. has been carrying on for the last four years it was brought to light that the number of new car sales influenced by the old car was steadily increasing until in 1924 it had reached more than 70 per cent for all lines of cars. Some low priced cars of large sales volume had a much lower ratio; in some States as low as 10 per cent of the new car sales were made on the basis of trading an old car. In the higher priced classes hundreds of dealers were doing a 100 per cent trading business.

These factors reveal with considerable certainty that the new car sales field of today and future years is more and more restricted to a replacement business.

Few "clean deals," where no old car is involved, can be expected by any dealer. On such a basis of selling merchandise it becomes more and more imperative, according to National executives, that the automobile dealer shall be in a position to make his legitimate net profit on the new merchandise and escape losses on the old merchandise which is rapidly becoming the bulk of his sales volume.

FORD TO "SCRAP" SHIPS

DETROIT, Aug. 20—Within a month the first of the 149 lake ships included in the fleet recently obtained by Henry Ford from the United States Shipping Board will arrive in the River Rouge. A force of men will commence cutting the 1500 tons of steel in each of the vessels. The "scrapping" process will require eighteen months, it is estimated.

GUDE DIES ABROAD

NEW YORK, Aug. 20—O. J. Gude, advertising man, died at Bad Nauheim, Germany, recently, and his body is being brought here for burial. He was co-defendant with the Ford Motor Co., John Wanamaker, Panhard & Levassor and others in the Selden patent suits filed in 1903.

FINANCIAL NOTES

Caterpillar Tractor Co. on Aug. 15 declared a quarterly dividend of $1.25 a share. Holders of Pierce, Fair & Co., cash deposit certificates for Caterpillar Tractor Co. capital stock; holders of Pierce, Fair & Co., deposit certificates for Holt Manufacturing Co. first preferred stock, and stockholders of the C. L. Best Tractor Co., now dissolved, who have deposited their securities with the Bank of California, N. A., for exchange for Caterpillar Tractor Co. stock, were notified that the actual stock of the new merger corporation was ready for delivery as of date of Aug. 10. Former stockholders of the C. L. Best Co. received 1½ shares of the new merger for each share of the former company turned in. Holders of deposit certificates for Holt Manufacturing Co., first preferred, received 1.7 shares in the merger for each of the Holt shares turned in.

The Auburn Automobile Co. has declared a stock dividend of 100 per cent on the common stock of $25 par value, increasing the capital of Auburn from $750,000 to $1,500,000.

"Earnings for July," E. L. Cord, vice-president, said, "approximated $1.50 per share on the new capitalization of 60,000 shares, after setting up a reserve for taxes and estimated earnings for the month of August, will approximate $2.25 per share. Within the last year the Auburn Automobile Co. has retired $500,000 in preferred stock, and we anticipate that the complete year of 1925 will far exceed the best year that Auburn ever had in both numbers of cars and earnings."

Motor Wheel Corp. of Lansing will call at 115 about one-fifth of its first preferred stock during the next week. The company has designated the Capital National Bank and the American State Savings Bank of Lansing to make payments on the stock presented. If the amount called is offered for redemption it will reduce the 16,150 shares now outstanding to 12,500 shares. If sufficient stock is not offered to make the proposed reduction the amount necessary will be called Oct. 1.

Norfolk Tire and Rubber Co. has declared a quarterly dividend of 40 cents on the common, payable Oct. 1 to stock of record Sept. 10. This is the first declaration on the issue since 1920. In the half-year ending with June sales amounted to $2,000,000, against $1,200,000 in the same period a year ago.

White Motor Securities Corp. has declared a quarterly dividend on 1¾ per cent preferred stock as of record Sept. 21, payable Sept. 30.

EDMUND & JONES ADVANCES

DETROIT, Aug. 19—For the first half year Edmund & Jones Corp. reports $2,573,729 sales with $191,046 net earnings, equivalent to $32.53 per share on 5874 preferred shares and $4.26 per share on the common before preferred sinking fund. Common dividend was increased from $2 to $3 per share, payable quarterly. The directors authorized sale of 10,000 shares unissued common, giving rights to common stockholders of record Aug. 14 to subscribe for one share of new for each four of old common owned at $26 per share, rights expiring Aug. 31.

Announce Program for S.A.E. Meeting

Interesting Papers to Be Presented at Sessions in Cleveland, Sept. 14-18

NEW YORK, Aug. 20—The Society of Automotive Engineers has announced its program for the production meeting to be held at the Hotel Winton in Cleveland, Sept. 14-16. Many interesting papers will be read by notable authorities. The program follows:

Monday Afternoon, Sept. 14

Sheet Steel Fabrication Session

"Hot Stamping Methods," by B. F. Keyes, Mullins Body Corp. "Sheet Steel Fabrication," by Syd Smith, Studebaker Corp. of America.

Training Session

"Training of Mechanics for Production Work," by Mrs. Lillian M. Gilbreth, Frank B. Gilbreth, Inc. "Foreman Training," by F. T. Jones, White Motor Co. "Training of Shop Foreman," by Louis Ruthenberg, Yellow Sleeve Valve Engine Works.

Monday Evening

Inspection of National Steel Exposition exhibits, showing processing from raw material to finished products, at Public Auditorium.

Tuesday Morning, Sept. 15

Gear Session

"Coordinating Designs and Production Methods in Gear Development," by P. L. Tenney, Muncie Products Division, General Motors Corp. "The Problem of Gear Production," by Earle Buckingham, Niles-Bement-Pond Co.

Tuesday Afternoon

Plant visitation. Cleveland factories will hold open house for visitors. Inspection of National Steel Exposition.

Wednesday Morning, Sept. 16

Machine Tool Session

"Machine Tool Needs of the Automotive Industry," by R. M. Hidey, White Motor Co. "The Application of Machine Tools to Specific Duties," by A. R. Kelso, Continental Motors Corp. "Machine Tool Selection," by A. B. Nickerson, Hupp Motor Car Corp.

Wednesday Afternoon

Gaging and Inspection Session

"Gages, Jigs and Fixtures—Their Development and Application," by J. Gustaf Moohl, Cleveland Automobile Co. "Inspection Methods," by C. B. Durham, Buick Motor Co.

Wednesday Evening

Grand Ball—The American Society for Steel Treating and the Society of Automotive Engineers.

N. A. C. C. HEADS TO MEET

NEW YORK, Aug. 20—The next meeting of directors of the National Automobile Chamber of Commerce will be held here Sept. 1.

National Safety Council to Meet

Announce Tentative Program for Fourteenth Annual Congress in Cleveland, Sept. 28

CLEVELAND, Aug. 20—Tentative plans for the fourteenth annual congress of the National Safety Council to be held in this city September 28 to October 2, have been announced by Arnold A. Mowbray, director of public information. The program calls for approximately 70 sessions to be devoted to various phases of the safety problem, at which 250 speakers will present their views.

Among the subjects scheduled for discussion are the work of the National Conference on Street and Highway Safety, "Safety and the Automobile", by Thomas P. Henry, president of the American Automobile Association, of Detroit; "The Need for More Definite Analysis of Accident Causes", which will be led by Dr. L. W. Chaney, U. S. Bureau of Labor Statistics; H. W. Donald, district manager, engineering department of the American Mutual Liability Insurance Co., Boston; E. W. Beck, supervisor of safety, U. S. Rubber Co., and E. J. Senne, safety supervisor, Vacuum Oil Co., New York.

Other Subjects Listed

Other topics of special interest to automobile men are "Getting The Injured Man Back To Work"; "Mechanical Safeguarding and Engineering Revision"; "How The Worker Can Be Educated by the Foreman". In each of these discussions men of national prominence will lead.

In the automotive section, R. F. Thalner, safety director, Buick Motor Co., will be chairman, with G. A. Kuechenmeister, personnel manager, Dominion Forge & Stamping Co., Walkerville, Ont., in charge of the program. Listed among the papers are "Why The Manager Should Be Interested In Safety", by C. C. Carlton, secretary, Motor Wheel Corp., Lansing; "Eye Accidents and Their Prevention," by Dr. Frank Allport, Chicago; "Hazards of Punch Press Departments Other Than Machine Hazards," by W. F. Dittmer, supervisor of safety, Westinghouse Electric & Manufacturing Co., E. Pittsburgh; "Who Is Boss?" by C. A. Hill, Muller Metal Co., Port Huron.

"How Far Should Management Go In Operation and Cost?" is the subject of a discussion listed for the employees' benefit associations section, with E. H. Olsen, Milwaukee Electric Railway & Light Co., leading. Other technical papers will be presented at this session, followed by general discussion from the floor.

One of the principal subjects to be discussed in the metal section meetings will be "The Safe Handling of Molten Metal In The Foundry," by E. H. Ballard, general foundry and pattern shop superintendent, River Works, General Electric Co., West Lynn, Mass.

Other sessions of particular interest will be devoted to plant publications, public utilities, rubber, taxicab and delivery, and various others important in the automotive industry.

COMPLETE FORD MOTOR NUMBER 12,000,000

DETROIT, Aug. 19—Ford motor No. 12,000,000 has been built. It was turned out recently at the River Rouge plant of the company and is now on display at the Detroit branch.

No. 12,000,000 was built slightly more than a year after No. 10,000,000 was put on the road. Since the motor department was transferred from the Highland Park plant to River Rouge, upwards of 1,500,000 have been produced at the latter place.

Metal Market in Fear of Inflation Period Ahead

(*Continued from page* 312)

burgh basis, the 2.60c price having disappeared.

Pig Iron—A very moderate demand for first quarter 1926 deliveries has developed, but automotive foundries generally have not begun to cover themselves so far ahead.

Aluminum—While prices for this metal and conditions remain unaltered, the market will bear watching with reference to developments in copper. Every advance in the red metal strengthens the position of aluminum in the competitive uses of the two metals, especially in wire and cables.

Copper—While the market is firm and the long-talked-of 15c price is quite likely to be the outcome of the present movement, many newspaper market reports must be read mindful of their purpose, which is to make pleasant reading for holders of copper mining shares. Automotive consumers, however, have shown somewhat more eagerness to protect themselves in the matter of prices for copper and brass products.

Lead—Absurdly high prices prevail in the "outside" spot market. The contract price is $25 a ton higher than on Aug. 15, 1924. Lead is scarce and a peak period of demand in sight, but for all that many believe that further spurts are out of the question.

Zinc—Firm.

PROMOTES FEDERAL AID

NEW YORK, Aug. 20—John C. Long, manager of the educational department of the N. A. C. C., is in Washington arranging for a campaign in support of Federal highway aid.

Plan for M.A.M.A. October Convention

Will Specialize on Advice to Executives at Sessions in Montreal

NEW YORK, Aug. 20—Information for executives is the foundation on which the Motor and Accessory Manufacturers Association is building the program for the annual fall convention, to be held in Montreal in October. The general theme will be, "Good Management," and the addresses and discussions of a four-day session will be devoted to fundamentals and experiences in management in all divisions of the automotive equipment manufacturing industry. There will be subjects of particular interest to general, merchandising and credit executives but the entire program is being worked out in such a way that all sessions will have features of value for men in all divisions of manufacturing management.

Outside of convention hours the delegates will have an opportunity to enjoy the Canadian metropolis

Speakers Widely Known

The convention speakers will include a number of nationally known business authorities and several others with wide reputations particularly in the automotive field. Merle Thorpe, editor of the Nations Business published by the Chamber of Commerce of the United States, is among the speakers from whom acceptances have been received. Others will be E. P. Chalfant of the Gill Manufacturing Co., president of the M. & A. M. A., W. T. Morris of the American Chain Co., president of Automotive Equipment Association; T. M. Simpson, secretary of the Continental Motors Corp.; F. E. Titus, vice-president of the B. F. Goodrich Co., and W. E. Wissler of the Herring Motor Co., automotive equipment wholesaler in Des Moines, Iowa.

Separate sessions will be devoted to general management, merchandising management and credit management.

The program is being developed by a committee headed by B. M. Asch, president of Asch & Co., in cooperation with the association staff, headed by M. L. Heminway, general manager. Mr. Asch and his associates on the committee include the following: N. W. Durnin, Houpert Machine Co., J. H. Cooper, Walker Mfg. Co., John Hennessey, Phinney Walker Co., S. B. Taylor, S. K. F. Industries, M. H. Tisne, A. Schrader's Son, J. I. Nevin, Moto-Meter Co., J. R. Duggan, Westinghouse Union Battery Co., C. R. Osborn, Overseas Motor Service Corp., L. A. Safford, McQuay-Norris Mfg. Co., F. B. Caswell, Champion Spark Plug Co., C. C. Carlton, Motor Wheel Corp., and E. P. Chalfant, Gill Mfg. Co.

Men of the Industry and What They Are Doing

Bartlett Reelected

M. W. Bartlett has been reelected president and general manager of the Splitdorf Electrical Co., electrical ignition and radio manufacturers of Newark, N. J. C. F. Splitdorf remains vice-president, as does H. P. Ingels as chairman of the board. With these officers the board of directors was completed with E. H. Schwab, George B. Alvord, C. E. Roraback and Joseph Remick. E. A. Kelley is secretary and treasurer.

Bowles Joins AC Co.

Stanley Bowles has been appointed sales manager of the AC Manufacturing Co., Chicago, manufacturer of rear wheel brakes for Ford cars and trucks, it is announced by the company. Before joining the AC concern, Mr. Bowles was sales manager of the Bilger Motor Co. one of the largest Ford sales agencies of St. Louis.

Knerr Quits Navy Plant

Horace C. Knerr has resigned as chief metallurgist, U. S. Naval Aircraft Factory after seven years of service, to engage in professional practice as a consulting metallurgical engineer, specializing in heat treatment and metallography of steel and light alloys. He has established a laboratory at 1500 Green Street, Philadelphia.

Tew Is Works Manager

J. D. Tew, who has been in charge of Goodrich tire production since 1918, has been appointed assistant works manager of the B. F. Goodrich Co. Since the resignation of H. K. Raymond, vice-president in charge of production, President B. G. Work has been the Goodrich works manager.

Rutherford Returns

William Rutherford, vice-president of the B. F. Goodrich Co., and president of the Rubber Association of America, has returned aboard the White Star liner Homeric after a six weeks' inspection of the European industrial situation, particularly as it affects the rubber industry.

Luce Directs Sales

Theodore Luce, president of Fuller-Luce, Inc., distributors of Lincoln automobiles in New York, has taken over full charge of sales. Frederic F. Lewis having severed his connection with the firm, W. L. Artz is now assistant to Mr. Luce.

Miller Quits Alloy Corp.

Ben H. Miller has resigned as production manager for the United Alloy Steel Corp., Canton, Ohio. He had been with that concern for fourteen years. He will take an extended vacation prior to engaging in other work.

REWARDS WORKERS AT GOODYEAR PLANT

AKRON, Aug. 19 — Celebrating the building of the 75,000,000th automobile tire manufactured under his direction, and the completion of twenty-five years of service with the Goodyear Tire and Rubber Co., P. W. Litchfield, first vice-president, announced last week a gift of $25,000 to the Welfare Committee of the Goodyear Industrial Assembly. The money will be used to assist deserving workers, for educational work and for rewarding unusual service or achievement.

Wier Is Assistant Sales Manager for Olds Works

LANSING, Aug. 19 — D. S. Eddins, general sales manager, Olds Motor Works, announces the appointment of Harold S. Wier as assistant general sales manager.

During the past eight years Mr. Wier has had a broad experience in every phase of automobile selling, including two years in the retail end of the business. In April, 1919, he joined the sales staff of the Chevrolet Motor Co., serving first in the capacity of factory representative and advancing rapidly to the important position of branch manager.

Mr. Wier succeeds Leon G. Dodge, who has been placed in charge of the new Oldsmobile wholesale branch in New York City. For the past two and one-half years Mr. Dodge has been assistant sales manager in charge of territorial work. His new duties will be concentrated on a large Eastern territory covered by the New York branch.

The appointment of Charles H. Hurst as manager of the newly created Oldsmobile factory branch in Chicago was also announced by Mr. Eddins. Mr. Hurst was local district man in Chicago prior to the establishment of the branch.

GARDNER HAS ANNIVERSARY

ST. LOUIS, Aug. 19—The Gardner Motor Car Co., which began business in 1875, but without the present designation "Motor" in its name, is celebrating its golden anniversary. The firm was started in 1875 by Russell E. Gardner to manufacture buggies. He is still active in the business, being Chairman of the Board of Directors, and Russell E. Gardner, Jr., is president.

To Attend Congress

David Fenner of the Mack Truck Co., and Jay Rathbun, export manager of White Motor Trucks, sail Sept. 3 aboard the S. S. Santa Ana to attend the Pan-American Highway Congress at Buenos Aires, Oct. 3.

Nichols to Sail

J. S. Nichols, Jr., vice-president of Dodge Bros. Motor Car Co., sails for Buenos Aires on Aug. 29, to study the South American automobile market and to attend the Pan American Highway Congress, Oct. 3.

Foster Goes Abroad

C. H. Foster, president of The Gabriel Snubber Manufacturing Co. of Cleveland, is in Europe where he will spend six weeks. Seventeen European car builders fit Gabriels as standard equipment.

Finland Agent Here

Frejvid Borg, managing director in the Motor Kompaniet at Helsingfore, Moon distributors for Finland, has arrived in St. Louis for an extended study of the factory.

Schreiber Due Home

Karl Schreiber, superintendent of the Springfield, Ohio, works of the International Harvester Co., is expected back from a vacation in northern Michigan this week.

Estabrook with Duplex Truck

M. W. Estabrook, formerly of the sales department of the Flint Motor Co., Flint, Mich., is now assistant sales manager of the Duplex Truck Co., Lansing, Mich.

Lennox Is Promoted

George A. Lennox has been appointed assistant general sales manager of the Driver Harris Co., with headquarters at the main office and plant at Harrison, N. J.

Cunningham Goes to Europe

Harry L. Cunningham, secretary-treasurer of Rickenbacker Motor Co., sailed last week for Europe, where he will study market conditions.

Beane Is Manager

The Swan Carburetor Co. of Atlanta, announces the appointment of R. S. Beane as district manager for the southeastern States.

Pabst Visits Detroit

Fred Pabst, manager for Don Lee, Cadillac distributor for California, is spending the summer in Detroit.

Shepard Is Manager

F. S. Shepard has been appointed general manager of the Bay State Tap & Die Co. of Mansfield, Mass.

Reports Point to Increased Trade

Sales and Production Continue on Strong Basis in Automobile Industry

(*Continued from page* 315)

Fageol Shows Profit

OAKLAND, CALIF., Aug. 20—Books of the Fageol Motor Co., of this city, opened to the public early in August, showed that the corporation during the first half of 1925 earned more than $300,000 in net profits, or nearly six times the preferred dividend requirements for the entire year. The complete balance sheet is not yet available, but from the figures given out it appears that the company earned approximately 36 per cent of its preferred stock, or at the rate of 72 per cent a year, while the earnings on its common stock were at the rate of 13½ per cent or 27 per cent a year.

Stutz Shows Big Gain

INDIANAPOLIS, Aug. 19—Stutz Motor Car Co. of America from records recently completed announces that its July production and shipments were 380 per cent by comparison with last year's mark, and this gain was made in spite of the fact that the first three days of the month were given over to completion of an inventory started in late June, and the holiday of July Fourth also came in with another productionless day. The July output and shipment figures also beat the record established in June, and the present month's activity forecasts that August production will at least approach last month's mark.

Stewart-Warner Report

CHICAGO, Aug. 20—The Stewart-Warner Speedometer Corp. balance sheet as of June 30 shows current assets of $13,521,745, against current liabilities of $2,632,998, leaving working capital of $10,888,747. Cash advanced to $1,884,075, against $730,474 as of Dec. 31, 1924.

Keystone Reports Loss

NEW YORK, Aug. 18—Keystone Tire & Rubber Co. for the six months ended June 30 reports a net loss of $67,731 from operations. After crediting other income, which amounted to $9,815, the company showed a deficit of $57,915 for the period. The general balance sheet shows net current assets of $385,684 and net current liabilities of $110,894.

Apco Earns $6 a Share

NEW YORK, Aug. 19—Apco Manufacturing Co. reports net earnings at the rate of $6 per share on Class A shares and its Ford accessories business increased 35 per cent the first six months of this year over last year. Earnings will show material increase during next few months owing to radio business now being booked for fall delivery.

WILLYS-OVERLAND TO UTILIZE WOOD WASTE

TOLEDO, Aug. 20—Wood waste from its body building plant is to be used as fuel by the Willys-Overland Co. of Toledo in combination with coal in the plant, which will supply power to its large new drop forging plant. The coal will be burned on six Taylor underfed stokers under the same number of 640 hp. boilers. Chutes and a conveyor system will introduce the wood above the stoker fuel bed, as is now being done at the plant of the Fisher Body Corp., Detroit.

It is planned to operate the Willys-Overland boilers at an average rating of over 200 per cent. When necessary, they can be forced to nearly 300 per cent to take care of peak loads. Stokers of this type respond very quickly to sudden demands for steam, which makes them especially adapted to plants of this kind, where the load is likely to change rapidly without warning.

Buick at Full Speed

FLINT, Aug. 20—Buick Motor Co. is operating on a schedule of 23,000 cars this month. All plants are in full operation and working forces are being increased. As a result of operating economies instituted during the past eighteen months Buick is producing as many cars with 12,000 men as formerly with 19,000.

Kelsey Wheel Report

DETROIT, Aug. 19—The consolidated income account of the Kelsey Wheel Co., Inc., shows profits before taxes for the first six months of the year $884,755. Net sales were $7,862,051. The balance sheet as of June 30 shows current assets of $7,289,284 and current liabilities of $1,016,370.

Timken-Detroit Earnings

DETROIT, Aug. 20—Net earnings of Timken-Detroit Axle Co. for first half of 1925 were $522,000, after taxes, charges and preferred dividends, equivalent to 63 cents a share (par $10) earned on 823,920 shares of common stock.

Balance sheet of Timken-Detroit Axle Co. as of June 30, 1925, follows:

Assets: Cash, $1,117,299; notes and accounts receivable, $2,221,628; inventories, $3,893,803; investments, $1,321,333; other assets, $462,844; permanent assets, $5,976,767; dies, jigs and fixtures, $1; good will and patents, $1; prepaid expenses, $87,401; total, $15,081,077.

Liabilities: Accounts payable, $674,928; accruals, $193,230; reserves, $324,475; preferred stock, $4,408,600; common stock (represented by 823,920 shares, par $10), $8,239,200; profit and loss surplus, $1,240,644; total, $15,081,077.

Velie Reports Gain

MOLINE, ILL., Aug. 19—Velie Motors Corp. reports a 69 per cent increase in July shipments over July of last year, and it is predicted that August business will be approximately double that of a year ago.

Velie has discontinued manufacture of the phaeton but will continue to build the club phaeton. C. W. Hadden, general sales manager, is visiting distributors in mountain and Pacific coast states during August.

Caterpillar Co. Prospers

NEW YORK, Aug. 18—The Caterpillar Tractor Co., through President R. C. Force, announces that the sales of the company and its predecessors during the first six months of 1925 amounted to $11,460,179. Present sales and the reports of dealers indicate that the last six months of the year should show an equally satisfactory volume. Combined sales of the concerns to which the Caterpillar Tractor Co. succeeded, namely the Holt Manufacturing Co. and the C. L. Best Tractor Co., in 1924 were approximately $18,000,000. Therefore, if the sales volume of the last half of 1925 equals that of the first half, there would be an increase of approximately $5,000,000 for the year.

Marmon Gains Abroad

INDIANAPOLIS, Aug. 19—An indication of the growth of the foreign trade of Nordyke & Marmon Co. is given by E. S. Gorrell, vice-president, in the announcement that foreign shipments of Marmon cars for the first six months of 1925 are more than double the foreign shipments for the first six months of 1924, and that present indications point to 1925 as the largest year in point of foreign exports in the history of the company. The actual increase of foreign shipments for the six months' period was 114.28 per cent, Col. Gorrell said.

February was the banner month of the six months' period, exports that month showing an increase of 400 per cent over exports in February, 1924. Shipments of the new Marmon to England, France and Germany have been particularly high since the first of the year.

Domestic shipments likewise are forging ahead. The statistical report for July, just issued, shows that shipments of the new Marmon to dealer and distributor establishments in July were greater by 101 per cent than shipments in July, 1924.

Coming Events

SHOWS

Sept. 8-11—New Haven, Mason Laboratory, Yale University Machine Tool Exhibition, direction of Amer. Society of Mech. Eng., Chamber of Commerce and Yale Mechanical Engineering Department.

Sept. 14-19 — Cleveland, Public Auditorium, Annual Convention and Exposition, American Society for Steel Treating, W. H. Eisenman, secretary.

Sept. 21-26—London, England, Annual Cycle and Motorcycle Show under auspices of the British Cycle and Motorcycle Manufacturers and Traders Union, Ltd.

Sept. 28-Oct. 3—Chicago, Fourteenth annual Safety Congress and Exhibit, Rainbow Room, Hotel Winton, under direction of National Safety Council, A. M. Smith, business manager.

Oct. 5-9—Atlantic City, Young's Million Dollar Pier, Manufacturers' Exhibition in connection with American Electric Railway Association Convention.

Oct. 8-17—London, Olympia passenger car show.

Oct. 18-31 — Salonica, Greece, First International Sample Fair.

Oct. 29-Nov. 7—London, annual truck show.

Nov. 26 - Dec. 6 — Berlin, Germany, Annual Automobile Show in the Kaiserdamm.

CONVENTIONS

Sept. 14-19 — Cleveland, Public Auditorium, Annual Convention and Exposition, American Society for Steel Treating.

Sept. 14-17 — Automotive Electric Association, Forest Inn, Eaglesmere Park, Pa.

Oct. 5-9—Atlantic City, Young's Million Dollar Pier, American Electric Railway Association.

Oct. 7-10—Montreal, Motor and Accessory Manufacturers Association Convention.

Oct. 21-23—Boston, Fall Meeting, American Welding Society.

RACES

Sept. 7—Altoona, Pa.

Sept. 19—Syracuse, N. Y.

Sept. 30—Fresno, Cal.

Oct. 10—Baltimore-Washington Speedway, Laurel, Md.

Oct. 12—Salem, N. H.

Oct. 24—Charlotte, N. C.

Nov. 26—Los Angeles.

S.A.E. MEETINGS

National

Aug. 27—Hotel Commodore, New York, Motorboat Meeting.

Sept. 15-16—Cleveland, Production meeting and exhibition.

Nov. 12-13—Philadelphia, Automotive Transportation meeting.

Nov. — Service Engineering meeting.

Urge Abolition of "Seasonal Trends"

Department of Commerce Automotive Division Believes Exports Would Gain

WASHINGTON, Aug. 20 — Timely suggestion that American automotive exporters, by dispelling their inborn theories on "seasonal trends," can build up a year-around foreign demand for American passenger cars and trucks, is made here this week by officials of the Automotive Division of the Department of Commerce.

"By educating foreign dealers to increase instead of decrease their sales efforts during the dull seasons," says the statement, "the so-called seasonal fluctuations can virtually be eliminated. In the end this practice would not only make for a larger volume of business through overcoming competition from foreign-made cars, but it would also permit export departments to operate at an even pressure, level the flow of ocean freight, permit the foreign dealer to use his capital to greatest advantage throughout the year and hold his sales organization together, operating at maximum efficiency at all times."

Fluctuations Shown

By means of a chart are shown the actual monthly export fluctuations in motor cars taken by foreign markets that absorbed 72.4 per cent of the United States passenger cars and truck exports in 1924, together with total averages, tracing what should be the normal trend of automobile exports.

For example the Australia-New Zealand group, which accounted for 26.4 per cent of American motor car exports during 1924, is given the highest key number of 100. The actual trend, based on 1924 exports, shows this group held its 100 key number until April, when it fell 12 per cent below March with a further 13 per cent loss in May over April, while under the theoretical averages set by the Automotive Division officials there should have been no fluctuation in American exports to this group until June, when the average key number for this group, held at 37 in February and March and 36 in April and May, dropped to 30, or an average of 17 per cent in June.

"The American automobile exporter," conclude the division officials, in commenting on the situation, "should further study carefully his individual foreign markets. Where a dealer has shown an inclination to cut down in advertising or curtail the activities of his sales force because of the national tradition that sales of no magnitude can be made during the rainy or winter season, this dealer needs educating to the point that he will recognize the advisability of intensifying his efforts during such periods.

"The alibi may be offered that country roads during certain seasons are unfavorable, that no touring is being done, etc. Granted this is true, then, high pressure selling methods are all the more essential at such times throughout those municipal centers where the roads are not affected by bad weather, and the sale of the year-around closed type of passenger car should be stressed. It is further to be borne in mind that there is a tremendous international program of good road building going on, and it follows that as better and more far-reaching roads are thrown open to motor traffic."

COMFORTABLE BEDS ON SALON COACHES

PARIS, Aug. 12 (*by mail*)—A regular service of salon coaches is to be started shortly by the Michelin Co. between their works at Clermont Ferrand in Central France and their Paris offices. The service will be a private one, for the use of officials of the company. Comfortable beds and washing accommodation are to be provided in the coaches, the idea being that the passengers shall travel at night and arrive at their destination fresh and fit for the day's business.

The coach bodies are being mounted on the new heavy-duty Renault six-wheeled chassis, which is not yet on the market.

Engineers Plan for Special Conference

Will Assemble During Sessions of American Society for Steel Treating

CLEVELAND, OHIO, Aug. 20—Participating in the technical sessions of the American Society for Steel Treating, in annual convention here Sept. 14 to 18, members of the American Society of Mechanical Engineers have arranged for a special meeting of their own Thursday afternoon, Sept. 17.

Fred H. Colvin, editor of the *American Machinist*, has arranged the program which calls for a paper on "Large Dies for Forging and Stamping" by Henry K. Spencer, general manager of the Blanchard Machine Co. of Cambridge, Mass., and one on "Dies" by S. A. Keller of the Keller Mechanical Engineering Co. of Brooklyn.

Automobile Men Named on Great Lakes Board

TOLEDO, Aug. 20—Appointments on the committees of the Great Lakes Regional Advisory Board made by Chairman L. G. Macomber include a number of automotive men.

A. Moore, assistant traffic manager of the National Automobile Chamber of Commerce, who is vice-president of the board, again heads the automobile committee. H. E. McGiveron, traffic manager of the Motor Wheel Corporation, Lansing, is chairman of the committee on automobile parts and accessories. The rubber and rubber products committee is headed by R. P. Bowe, traffic manager of the Goodyear Rubber Co., Akron.

INVENT NEW SEXTANT

LISBON, Aug. 12 (*by mail*)—Methods of aerial navigation may be altered by the use of a sextant which enables a pilot to make observations for his bearings while in flight. Satisfactory tests are said to have been made.

AUTOMOTIVE INDUSTRIES
VOLUME 53 *New York, Thursday, August 27, 1925* NUMBER 9

Next 18 Months Look Bright If Present Policies Are Continued

Effects of price cuts and insurance plans remain to be seen. Increased quotas may worry dealers. Prospect is that competition will be keener in 1926

By Norman G. Shidle

THREE questions of major importance are before the automobile industry as the summer vacation period draws to a close:

1. What effect will the price cuts have on factory and dealer profits in the next six or twelve months?
2. Can sales be expanded sufficiently during the last half of this year and the first half of next year to keep busy the increased factory capacity which the industry will have by the end of 1925?
3. How will dealers be affected by the combination of lower car prices, decreased participation in insurance and financing profits, and increasing sales resistance due to basic marketing factors?

One important fact is worth considering as regards the entire automotive situation:

The policy of holding production well in line with retail sales has proved profitable and feasible both for dealers and manufacturers.

As that policy has been so successful during the sixteen months since it began to be applied strictly by a large majority of makers, there would seem to be every likelihood that car builders will adhere to it in the future and every reason against abandoning it. Thus far no serious temptation to fall back into evil ways has arisen. Some considerable courage was needed to keep the policy intact in the early months of 1925 when sales didn't come up to expectations. But the manufacturers had given their word and they kept it.

Since March of this year a good many car builders have been so busy trying to supply the demand for their cars that they haven't even had to think about refraining from overloading their dealers. When demand is ahead of supply there isn't any need to say "Get thee behind me Satan."

Some executives looked for the "production-in-line-with-sales" policy to get a real test this summer when the usual falling off in retail sales started. But the test hasn't come yet. July sales went far ahead of June in most lines and in many important areas. August has held up remarkably well. And factory production has been curtailed to some extent.

So everything looks satisfactory right now. No real test of how strongly this policy is embedded in automotive merchandising will occur until production facilities again exceed demand by a considerable margin. And that time is not likely to be yet awhile. Here's the bright automotive picture which appears on the business screen today:

1. General business conditions, on which automotive sales rest, are better than they have been for many months. Increased prosperity is being reported in almost every line.
2. Production has not exceeded sales by any material margin in the automotive field for over 15 months.
3. Dealer stocks are low and used cars are moving better than they were a year ago.
4. Prices were lowered at a psychologically correct time. Coupled with the new model announcements after the end of the spring selling season the price decreases gave a stimulus to retail sales just when it was most needed.
5. Finance companies are offering terms which makes buying very easy for almost anybody; hence selling is easier.

That is the situation at present. But still the questions asked at the beginning of this article are definitely before the industry and the need for emphasizing the desirability of sticking to the policy of coordinating production with sales is not entirely lacking.

If this policy is adhered to closely by a large majority of important manufacturers next winter and next spring as it was during the past twelve months, the three questions can be answered quite readily.

In this case price cuts probably will mean slightly decreased profits both for manufacturers and dealers, because without undue forcing the market isn't likely to absorb a great many more cars in the last half of this year than it did during the first half. The lower prices themselves tend to extend the market somewhat, while better general business conditions will help as well. But fall and winter buying relatively never is up to that of the months which are more favorable to automobile use, even in these days of the closed car. Profits in the first six months were so excellent for most automotive concerns, however, that slight decreases in the next six would not be of very great importance.

If production is held in line with sales, some of the factory capacity brought into being for the first time this year may not be kept busy constantly during the next eighteen months. Where this turns out to be the case, of course, the increased overhead would tend to decrease the net profits of the individual company.

If production is held in line with sales, dealers probably will have to take a profit decrease as well as the factories, but their inventories will be kept in good shape, the lower prices will give them a reasonable chance of increasing their volume and increased incentive to cut out the waste in their own methods and operations.

Hinges Largely on Production

The brightness of the automotive picture today coupled with the outlook for sound business and fair returns in the next eighteen months makes the future look promising so long as production is held in line with retail sales.

And there is every indication that a large majority of important companies will adhere to that policy and reap the favorable results which accrue from it.

Stories are beginning to come in from here and there, however, to the effect that dealers in certain lines are being asked to double their quotas for next year, despite the fact that in 1925 they have been showing big gains over 1924 sales. Some dealers who are being urged to contract for more cars than they think they have any chance of selling are somewhat dubious about their own future. They are arguing something like this:

"It's all right to say that lower prices will give us increased volume so that we can make the same or bigger profit despite the fact that our margin on an individual car is smaller. **BUT**—there is a limit past which that theory doesn't work. The old law of diminishing returns begins to get really active after a while and we're of the opinion that the time of its greatest activity has just about arrived.

"Seeing Is Believing"

"Why should we kick, you ask, when the factories haven't forced cars on us yet and have been adhering to a policy of holding production in line with sales? Well, we'll tell you why! Because we're being asked to sign up for a whole lot of cars next year and because we aren't at all confident that we won't be forced to take them if the time comes when the factory has to make the choice between forcing cars on dealers and letting some of its plants stand idle. Handing as many cars to the dealer as he could be made to take usually has been the choice in the past. Maybe they've reformed for good. Let's hope so. But we won't be sure until the pinch comes. Seein's believing."

The presence of cynics in the retail ranks might as well be recognized—as should be the rather sound basis for some of their cynicism. Men of this kind probably are not in a majority, but they are numerous enough to make their ideas felt. They aren't particularly pleased

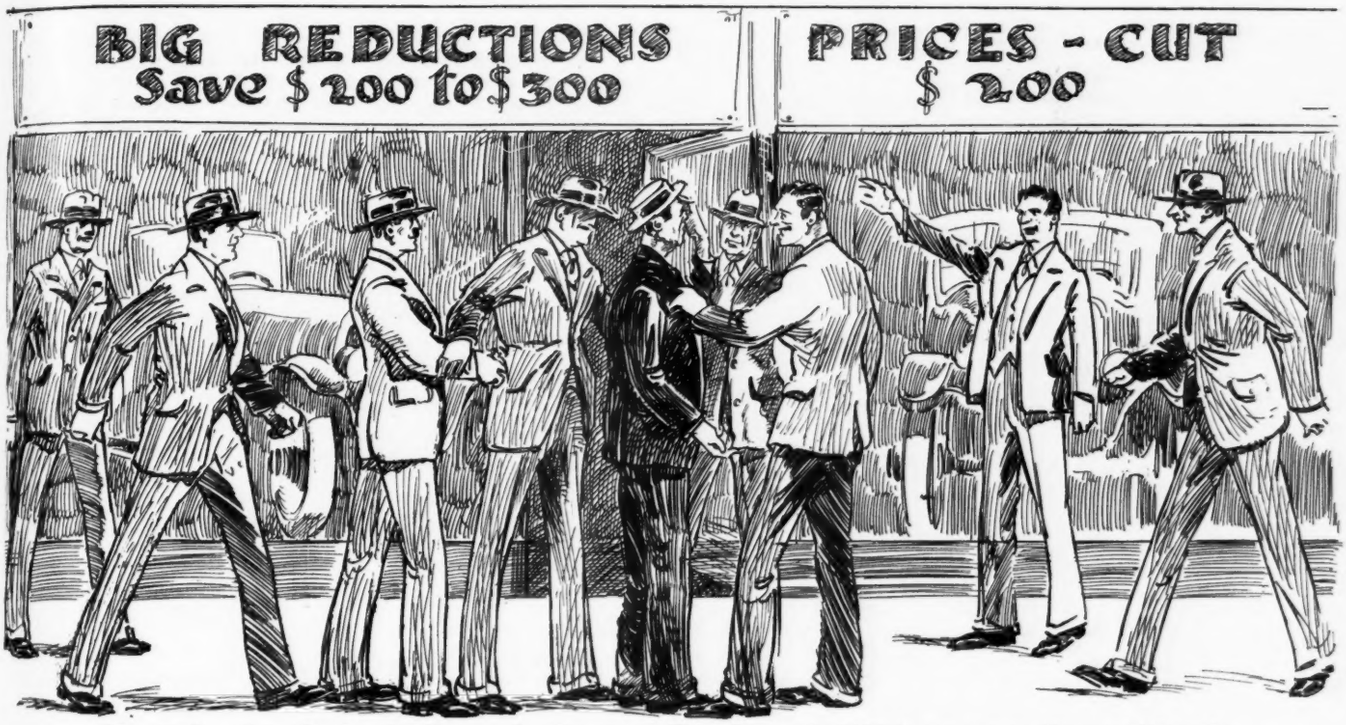
about the growing tendency on the part of the manufacturer to control fully the insurance and financing charges that go with most car sales today. They admit that they have been getting personal profits from these transactions and claim that they must continue to get them if they are to make anything like a reasonable profit. Car prices are so low and trade-in prices so high, they urge, that the dealer has to make most of his profit from side lines of this kind. Gradually the possibilities for profit are being eliminated, they feel.

To some extent this sort of pessimism can be attributed to retailers who have failed to take advantage of the real possibilities of their territories, who have failed to organize their operations efficiently and who have failed to do a good job of selling and servicing. Their failures are due largely, perhaps, to their own deficiencies and they tend to rationalize by laying the blame on factors which they do not control. If more dealers were built into thorough-going business men, less difficulties of this kind would be heard of.

But opinions of this kind are not confined to the inefficient retailers. They have been expressed very vividly by a number of the best and most successful automobile merchants in the country, some of them distributors for prominent lines and others dealers handling successfully and efficiently the territories which have been allotted to them. While recognizing the presence of a certain number of chronic kickers in the dealer ranks, manufacturers would be foolish not to recognize also the presence of critical views in the minds of thoroughly competent retailers and wholesalers.

In one sense, the whole question gets back to the policy, now proved successful, of holding production in line with sales. Few dealers have serious fears for the future if this policy is adhered to; most economists and students of the industry believe in its efficacy; and a large number of important executives seem willing to stake their merchandising future on its soundness. By the same token, the possibility of overproduction and of dealers forced to take cars which they cannot dispose of causes fears for the future to be expressed whenever it is mentioned.

A conservative view of the difficulties which may arise



"Expansion of production facilities and price cuts will tend to make 1926 in some ways the most intensely competitive year the automobile industry has ever seen"

through excessive competition brought on by increase of production facilities faster than demand was given the other day by a prominent middle western banker who is thoroughly familiar with automotive trends and operations. His prediction for the course of the automotive industry from now until the end of 1926 ran something like this:

"Car manufacturers again are expanding their production facilities, although not at so rapid a rate as during past boom periods. Since capacity already was considerably in excess of basic demand, however, the differential between the two will be considerably greater at the end of this year than it was at the beginning.

"Prices have been lowered so much as to indicate that some of the companies at least have set their price so low as to make absolutely necessary increased output if reasonable profits are to be procured. They are gambling present low price against greater future volume.

"These two factors will tend to make 1926 in some ways the most intensely competitive year the automobile industry ever has seen. Having based price on future volume, some companies will be forced to do everything possible to get that volume. The possibilities of increasing total sales very greatly does not seem good in the light of economic studies. That means one company must take the business from another. With a number striving toward the same end and with strong finances and merchandising forces acting in each case, there would seem to be small chance of a single company changing its relative share of the business materially in the long run, although it may make considerable inroads for certain years.

Means Strenuous Competition

"This condition, then, means strenuous competition. There will be a strong temptation to force dealers to take cars they don't want. Such action will in turn tend to give impetus to even more liberal financing terms than now are being extended in an attempt to stimulate the market.

"If these things happen dealer car stocks are likely to get large, used cars will be harder to move and an unusually large amount of unpaid-for automobiles will be in the hands of the public. The industry then would be in poor shape to meet any decline in the general business cycle.

"And such a decline may come within sixteen to eighteen months. Nobody can predict such things with certainty, but that's my present guess.

"The automobile industry at present is in a thoroughly sound condition. It will continue to be in that condition provided manufacturers do not permit a desire to gain a temporary competitive advantage to outweigh their best business judgment or to lead them away from the principles of operation which their own experience has proved sound and workable."

Opinion Worth Considering

Bankers are notoriously conservative and often are accused of business pessimism, but their opinion is well worth serious consideration.

Parts manufacturers have been affected directly, of course, by the current readjustment of car prices to a lower level. While a good many parts and equipment makers came through the first half of the year with big profits, it is certain that they are being called on to bear their fair share of present reductions.

The parts maker is in a bit more difficult position than the car maker because he has to abide by the business judgment of the latter to a large extent whether he thinks it is right or not. If a car manufacturer decides to gamble price against a hoped for future increase in volume his parts suppliers automatically are called upon to gamble with him. If he wins, they win. If he loses, they lose. If the parts maker disagrees with the car manufacturer's judgment strongly enough, of course, he is privileged to give up the business and let one of his competitors take it over. That has happened in the past and may happen again in the future. But it doesn't help the parts maker much, because, naturally, he wants as much profitable business as he can get—and often is willing to gamble that it will be profitable.

But the prospects for sound progress through 1926 among both car manufacturers and dealers and among parts and accessory makers are good, because, despite temporary waverings and detailed difficulties, the vehicle makers in general are more and more coming to hold to a few basic principles which have proved their worth as success builders. Among the more important of these are:

1. Production, generally speaking, should be held in line with retail sales.
2. The dealer is an integral part of the factory organization. His success is the factory's success. He should be given whatever constructive help the factory can provide and should not be burdened with an unfair share of the financial or stock-carrying burden of the industry.
3. Stable, reliable sources of supply for parts and equipment are essential to a sound manufacturing plan. Price is only one element in determining the desirability of a source of supply. The supplier must make a reasonable profit from the original equipment he sells or he is likely to be out of business next year or to try to make up in lowered quality or inefficient service what he has been forced to give away in original price.

Plenty of exceptions to these policies can be found. But more companies believe in them today than did five years ago. The trend is definitely toward better relationships between all branches of the business. And better relationships and a continuance of sound policies will guarantee automotive prosperity for the next eighteen months.

New Coupes and Sedans Are Added to Packard Line

A NEW four passenger coupe and a five passenger club sedan together with a new special Holbrook coupe now are being offered by the Packard Motor Car Co. The four passenger coupe and the club sedan are mounted on the six and eight chassis both while the Holbrook coupe is offered only on the eight chassis.

The four passenger coupes and the club sedans both have large decks at the rear with railings and each carries a water and dust-proof metal trunk.

The club sedan is mounted on the 133 inch wheelbase six-cylinder chassis and the 143 inch wheelbase on the eight chassis. The price of the Six club sedan is $2,725, while the price of the Eight club sedan is $4,890.

Dimensions of the club sedan body are alike for both the six and eight chassis.

The trunks on both six and eight club sedans are 44 3-8 in. long, 19 3-8 in. deep and 15½ in. wide.

The rear seats are 49 in. wide. Two hassocks made of the same material as the carpets are provided for foot rests instead of the usual foot rail. Leg room in the rear seat is increased by cutting away the back of the front seat at the bottom for additional toe room. Four wide doors give access to both front and rear seats independently of each other. The front seat has a width of 46 in. and is of the same upholstering as the rear seat. Curtains for the rear windows are carried on concealed rollers.

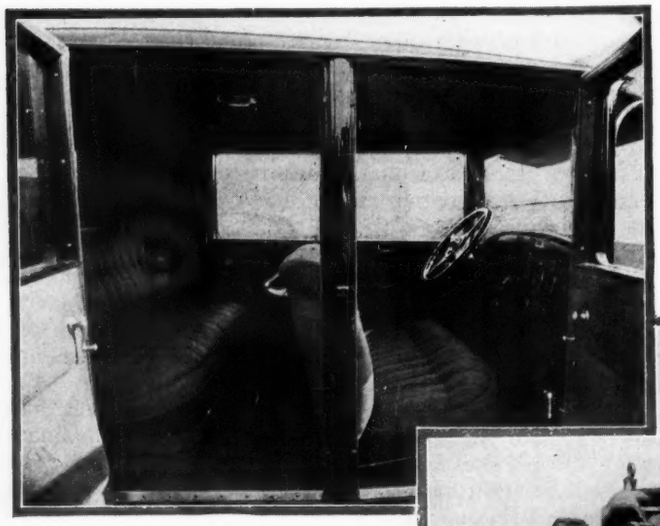
The four passenger coupe in the six-cylinder line is mounted on the 126 in. wheelbase and the 136 in. wheelbase chassis is used for the eight coupe.

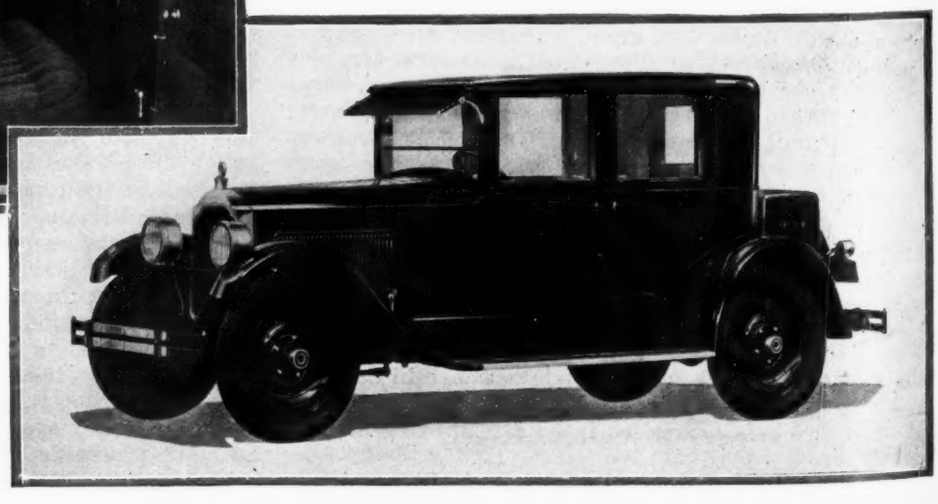
The driver's seat is set a little ahead of the two passenger seat across the rest of the rear of the body. To the left of the rear seat is a parcel compartment with an opening in the top 8¾ by 17¾ inches. The two doors are made exceptionally wide, giving the same opening as in the seven passenger sedan bodies.

The fourth seat which folds back under the cowling when not in use has a size of 17¾ by 17⅝ in. The driver's seat has a seat cushion 22 in. wide by 17⅝ in. deep. The back measures 23½ in. across. The two passenger seat is 39 in. wide and 21 in. deep. Curtains in concealed rollers are provided for the rear windows.

Equipment on both coupes and both club sedans is the same as that on other enclosed models.

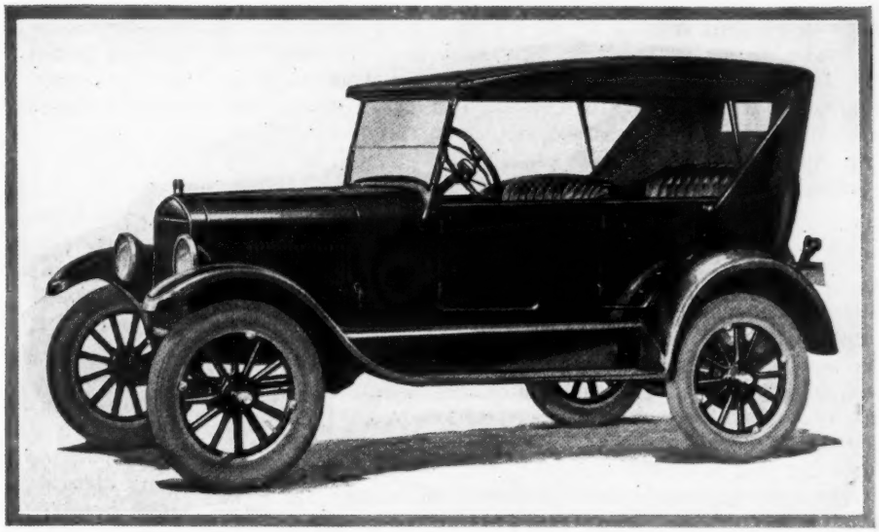
The new Holbrook coupe is mounted on the 136 in. wheelbase chassis. It is a two passenger car and complete with full equipment lists at $5,775.





The new five-passenger, four-door sedan on the Packard Six chassis. Interior arrangement shown above

FORD Changes Announced—



THE new Ford touring car, with four doors and body which is 4½ in. lower from top to road, and 3½ in. longer. Note modern streamline effect, and dummy cowl ventilator which serves as opening into fuel tank.

Chassis Lowered; Bodies Lengthened; New Brakes and Fenders

Fuel tank placed under cowl. Closed cars finished in bright color.
Radiator raised. Door added to touring and runabout.
Passenger space increased. No price changes.

BODY changes and chassis refinements more pronounced than any made since the adoption of the Model T chassis in 1908 were announced this week by the Ford Motor Co. With the announcement came the statement that there would be no change in present prices.

Outstanding features of the improvements in both open and enclosed types are lower and longer all-steel bodies on a chassis which has been reduced 1½ in. in height; complete new design in most body types; a change from black to green and maroon in the closed cars; larger, lower fenders; newly designed seats and larger and more powerful brakes.

The composite wood framework and steel panel construction is retained in the Fordor body.

The increased length of the improved models is still further accentuated by the new body lines in combination with a higher radiator and a redesigned cowl. The radiator is ⅝ in. higher. Wide crown fenders hung close to the wheels contribute to the general effect of lowness and smartness.

While the runabout and touring car remain in black, the closed bodies are finished in colors and have nickel radiators. The coupe and Tudor bodies are in deep channel green while the Fordor is finished in Windsor maroon. Greater comfort is provided for driver and passengers in both open and closed cars by larger compartments, more deeply cushioned seats and greater leg room. In all models except the Fordor, the gasoline tank is under the cowl and is filled through a filler hidden from sight by a cover similar in appearance to a cowl ventilator. One-piece windshields and narrowed pillars in the Tudor and coupe give better visibility and ventilation.

Driving comfort has been increased by lower seats, improved back rests and lower steering wheel. Brake and clutch pedals are wider and more conveniently spaced. The open models now have a door at the left of the driver and side curtains, held secure by rods, open with the doors. Cord tires are standard equipment on all models.

Production Under Way

At the main offices of the company it was stated that production of the new line is under way in all assembly plants throughout the country and improved cars are being sent to dealers for showing.

The reduction of 1½ in. in the chassis height has been effected without materially decreasing the road clearance by lowering the crown of the springs one inch and by raising the front wheel spindles ½ in. on the spindle bodies.

The coil box has been removed from the dash and now is mounted on the left-hand side of the engine, which change makes it unnecessary to enter the driving compartment to make adjustments. The fan has been raised and the adjustment for belt tension improved. The fan bracket is now an integral part of the cylinder head outlet and is provided with an eccentric adjustment.

One of the most important improvements is in the brakes. The transmission brake band has been increased from 1⅛ to 1¾ in. in width, this change resulting in smoother braking and in longer life and less frequent adjustment of the bands. All transmission bands now have removable ears to facilitate replacement and hardened steel shoes have been placed over the clutch casing keys to prevent wear.

Brake drums at the rear axle have been increased to 11 in. in diameter from 8 in. and the width has been increased from 1-5/32 to 1½ in. The brake shoes now are covered with an asbestos composition material eliminating the old method in which braking was effected by direct contact of cast iron shoes.

Flanges on Pedals

The brake and clutch pedals in addition to having wider surfaces and being spaced further apart, have been provided with flanges at the side to prevent slippage of the driver's foot.

In all models except the Fordor, the steering wheel has been dropped three inches for greater ease of driving as the seats have been moved back and lowered. The steering wheel on all models is 17 in. in diameter and the steering gear reduction is 5 to 1.

The new gas tank location under the cowl, which is used in all models except the Fordor, feeds gasoline to the carbureter at an abrupt angle and insures fuel supply even on the steepest grades. A large trough and overflow pipe has been provided at the filler to carry any spillage directly to the ground. This change places the sediment bulb on the tank under the hood in a readily accessible position. Adequate separation of the fuel tank from the engine is provided by the dash.

The new crown fenders, in addition to being wider and larger, extend further down front and rear to afford better protection against splashing. The running boards on all models are wider and nearer to the ground.

Standard accessory equipment on all closed cars includes windshield wiper, rear view mirror, windshield visor and dash light. The dome light is continued in the Fordor and windshield wipers are supplied on the open models.

On the Tudor and coupe, the windshield is a one-piece design opening forward. A passageway at the base of the shield directs ventilation downward into the front compartment when the windshield is slightly opened. The open models have a double ventilating type of windshield, both halves opening, and the Fordor shield has been redesigned to conform with the new cowl. The lower half of the windshield on this model is stationary and there is no cowl ventilator as before.

Hood Is Larger

The radiator is ⅝ in. higher and the hood is larger with more louvres. The closed model windows are plate glass and lower flush with the moldings, conveniently located lifters being provided for the purpose. Doors on all models open forward with the exception of the rear doors on the Fordor.

A new design of arm type tire carrier is provided which accommodates either the new Ford wire wheels or the demountable rim. The headlights have polished nickel rims, are set higher and further apart, and are attached to pressed fender supports. On all body types, the tail light and license plate bracket are now located on the left rear fender.

Tudor upholstery is gray fabric with a fine green stripe to harmonize with the deep channel green exterior finish. Head linings are gray as is the silk back curtain and the carpet is greenish gray. The height of this body from top to road has been reduced four inches and its length has been increased 3½ in. The seats are 2½ in. lower from top of seat to floor and this with the 1½ in. drop in the frame brings them 4 in. nearer the ground. To provide more leg room, the distance from the back of the front seats to the front of the rear seat has been increased two inches.

In the coupe, which has the same upholstery as the Tudor, the rear deck has been made the full width of the body and extends well back over the rear spring with fenders bolted to the body, with resultant increase in the storage space available at this point. The shelf at the back of the seat is five inches deeper and the doors also are broader. The overall height of this body has been reduced 4½ in. and it is 3½ in. longer. The reduction in seat height is the same as in the Tudor.

In the Fordor model, the upholstery fabric is gray with a fine red stripe to match with the new maroon exterior finish. Head linings and silk window curtains are gray and the carpet also is gray with a suggestion of red. The height of this model is 1½ in. less, due to the chassis changes, but otherwise there are no other dimensional alterations.

The rear deck of the roadster has been redesigned along the same lines as the coupe. This model now has two doors, both of which are wider. The seat has been redesigned to give more comfort and a reduction of 2½ in. in its height from the floor has been made. This model is 4½ in. lower from top to road, 7¾ in. longer and its seat is 3 in. wider.

Doors Are Wider

The touring model also has a door at the driver's left and all four doors are wider. Seat contours have been improved and their tops are 2½ in. nearer the floor. Three inches has been added to the width of the front seat and five to the rear. A reduction of 4½ in. has been made in the overall height of this model and 3½ in. has been added to its length. The distance between the back panel of the front seat and the front of the rear seat has been increased 3½ in.

In bringing out the improved models, the Ford Motor Co. is cautioning its dealers throughout the country against the use of the word "new." It is pointed out that, while it is true certain refinements have been added to the chassis and that these are more radical and more conspicuous than any which have heretofore been made, the Model T chassis, though lower, remains basically the same in design and construction as it has been since 1908. The objection to the use of the word "new" is based on the fact that it implies a redesigning of the chassis as well as the body.

As far as can be ascertained at this time there has been no change in the powerplant, notwithstanding the many rumors that have been circulating recently in automotive circles.

It is apparent that the efforts of the Ford engineers have been concentrated chiefly on obtaining greater beauty and comfort in design. An analysis of the cars shows that most of the changes have been influenced by this factor. The only important mechanical change has been made in the brakes. Greater convenience and comfort for driver and passengers has resulted from moving the fuel tank to its new position under the cowl, increasing the size of the seats and providing more leg room, lowering the steering wheel, adding an extra door to the touring car and runabout, and placing the brake and clutch pedals farther apart and providing each with a flange at the side to prevent the foot from slipping.

Present Ford prices are: Runabout $260, touring car $290, coupe $520, Tudor sedan $580, Fordor sedan $660. No price changes have been made since Dec. 2, 1924, when the Tudor and Fordor models were reduced.

New Three-Purpose Commercial Plane Uses Salmson Radial Engine

Machine built by Woodson Engineering Co. may be adapted to passenger service, messenger work or aerial photography. Has speed of 130 m.p.h.

A NEW three purpose commercial plane, the "FLOTO CA-1," has just been put on the market by the Woodson Engineering Co. of Bryan, Ohio. This plane, equipped with the Salmson Z9 nine-cylinder water-cooled radial engine, which proved very reliable during the World War, is intended for either passenger service, messenger work or aerial photography. To this end the cargo space has a rather unique design. The seats fold back out of place when it is desired to carry cargo, and folding doors form an integral part of the bottom of the fuselage for use when utilizing the plane for aerial photography. The plane may also be used to good advantage on mail feeder lines.

The span of both upper and lower planes is 29 ft., 6 in., the wing loading being 8.4 lb. per sq. ft. The upper main plane, which has a chord of 5 ft., 6 in., is butted together and joined with plates, and is supported with four cabane struts at 45 deg. from the fuselage. The lower wings are attached directly to the fuselage and a complete set of bracings, including double flying wires, a single bay of struts and single landing wires give the plane an impression of reliability.

The construction of the plane insures very good visibility, the gap at the fuselage measuring 6 ft. The aileron wires, following modern practice, are placed inside the wings, but windows are provided in the covering for inspection of the wiring. The spars are made of solid spruce routed to I-beam sections. Plane ribs have been cut out to obtain lightness and are made of spruce whereas the internal bracing is made of heavy steel rods.

The fuselage is of wood construction and has ⅛ in. three-ply veneer glued and screwed to it. It is of the general type that has been used in the various planes of the Air Mail Service during the past seven years. The engine cowling is made of aluminum fitted with quick-detachable fastenings and entirely encloses the motor. The motor mount has been especially designed to obtain ease of accessibility and the whole power plant unit can be removed quickly and easily by merely loosening four bolts.

The empennage is partly of wood and partly of steel tubing construction, the elevators, fins and the balanced rudder being built of wood. The landing gear is made of steel tubing streamlined with balsa wood and is designed to use elastic cord for shock absorbers in such a manner that a new one can be placed in a few moments. The tail skid is of the leaf-spring type with a changeable shoe. 750x125 mm. wheels are used. A wide detachable windshield is supplied for use in front of the cargo space when passengers are carried.

The "FLOTO CA-1" commercial airplane with Salmson radial engine

The performance of the plane is highly commendable, especially considering the fact that it can carry a useful load of 1235 lb., its weight empty being 1420 lb., and with full load 2655 lb., a power loading of 101 lb. per horsepower. The plane has a maximum speed of 130 miles per hour, a cruising radius of 400 miles, a service ceiling of 18,000 feet and can climb 10,000 feet in 14 minutes under full load.

The length overall is 23 ft. 3 in. and the height 9 ft. 2 in. The area of the wings, including ailerons, is 311 sq. ft., ailerons 33 sq. ft., tail plane 10.3 sq. ft., elevators 10.8 sq. ft., rudder 10.3 sq. ft., and the fin 3.7 sq. ft. The wing section is R. A. F. 15. The fuel capacity is 85 gals., giving a cruising speed range of 400 miles.

Effective Control of Parts Distribution Worked Out by G. M. of Canada

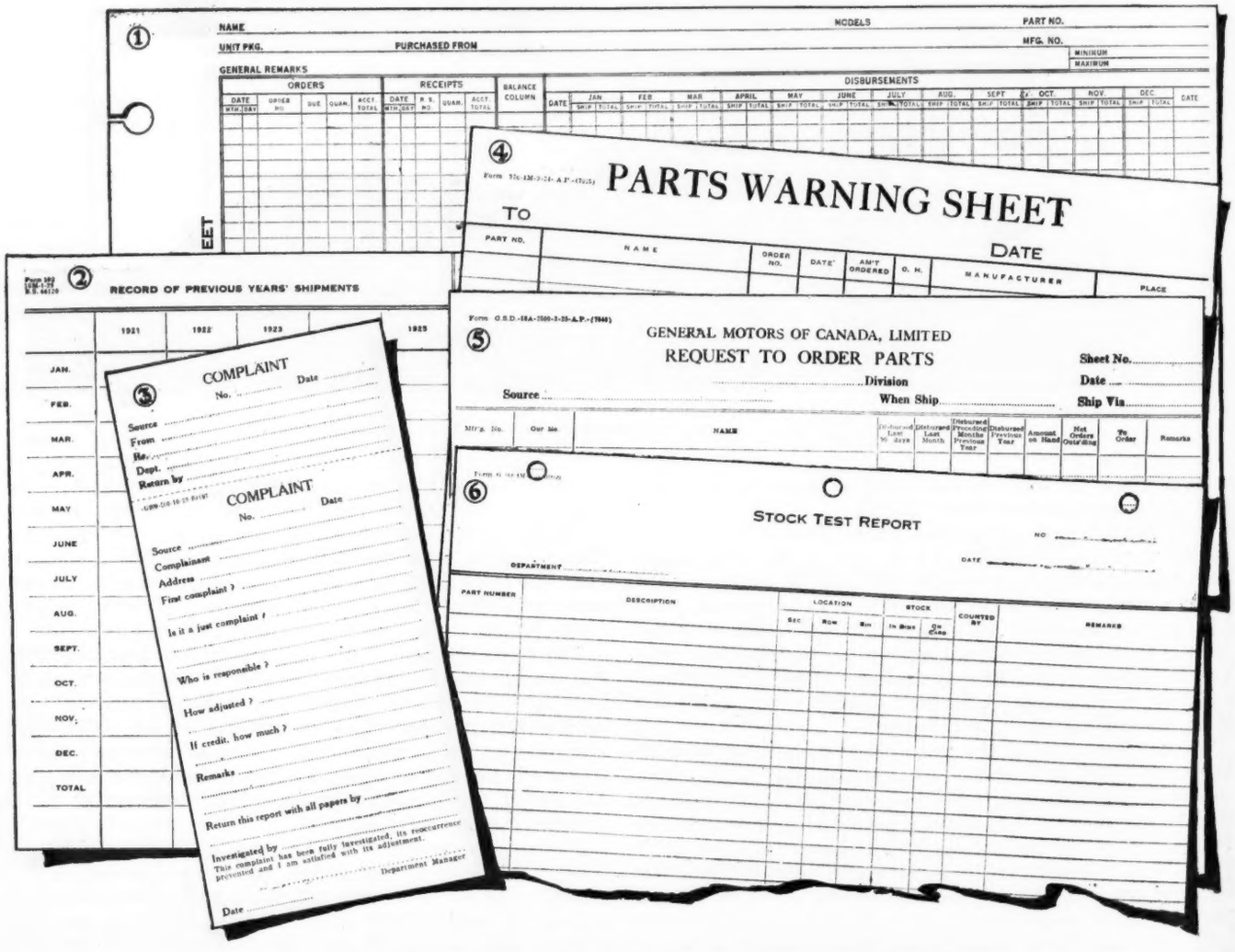
Complete records kept of purchases, stock, sales and shipments.
Plan prevents delays and eliminates excessive inventories.

EFFECTIVE control of parts distribution involves three factors: Purchasing, storekeeping and shipping. These services must be closely correlated so that present and future demands for parts can be anticipated by the stores department, bought and expedited into the stores by the purchasing department, and packed and shipped without delay by the shipping department after actual orders are received.

General Motors of Canada has evolved and is operating a parts distribution system which satisfactorily meets these requirements. Its first essential is speed in making shipments and to be able to accomplish that the prime requisite is that material must always be available for immediate shipment. To always have enough parts on hand to make shipments when needed without building up an excessive inventory is a real job and one which this method accomplishes successfully.

The stock record sheet shown in item (1) in the accompanying illustration provides a complete record of each part for the information of the storekeeper and the buyer. Record is made of all purchase orders placed, when and how much material is received, and shipments. Information concerning purchase orders and receipts is obtained from the purchasing and receiving departments. The shipping department makes up lists of shipments on a tabulating machine and daily totals are posted on the stock record sheets which are filed in loose leaf binders.

The practice of entering disbursements by months is very helpful in making estimates of future demands



Forms used by General Motors of Canada in its parts distribution system

since any seasonal variation in demand for parts is clearly shown. As an additional aid in this respect, the reverse of the stock record sheet, shown in (2) gives monthly shipments for the previous five years. With these comparative figures before him the buyer can make reliable estimates of the demand for the immediate future, thus assuring ample stock, but preventing excessive inventory.

When the store's clerk notes that the balance on a part is below the minimum amount shown on the stock record sheet he fills out a Request To Order Parts sheet shown in (5). On this sheet he summarizes for ready reference by the purchasing agent the past demands as given on the stock record sheet. Usually this will provide the buyer with sufficient information for his purposes so that he will need to see the detailed record only occasionally.

Parts Warning Sheet

As a sort of follow-up sheet for use only when the supply of a part is in imminent danger of being exhausted the Parts Warning Sheet is used. The heading of this sheet is printed in red, the accepted color for danger, and when the purchasing agent receives it from the stores department he knows that immediate action is necessary on the items listed on the sheet. Tracers are started after the shipments and every effort made to get the parts into the stockroom as soon as possible.

The Stock Test Report shown in (6) is used by the stock clerk to make sure that his records balance with the actual amount of material in stock. He fills in the part number and name of the parts he wishes checked and sends it to the stock keeper. The stock keeper counts the number in stock and returns the sheet to the stock clerk who adjusts his records to agree with actual conditions.

As a check on the efficiency of the shipping department the manager of the parts division maintains a chart showing the percentage of orders shipped on the day in which they were received. This chart is posted weekly and if there is any downward tendency portrayed the manager at once takes steps to learn the reason and to prevent further lapses.

Another chart shows back orders by weeks as percentages of total orders received. If the number of back orders tends to increase another investigation is started to determine what parts are causing delay and whether it is due to failure of the stock department or the purchasing department.

The Complaint Card

Item (3) in the illustration shows the Complaint Card used in registering complaints received. After the card is filled out the upper portion is torn off and retained by the general parts and service division as a permanent record. The lower portion goes to the department manager who investigates the complaint and makes a report as indicated by the questions on the card. Use of this form definitely fixes the responsibility for the cause of each complaint and provides a record which can be referred to in case there is a recurrence of the complaint.

This method of controlling parts distribution is quite simple, as such a scheme should be, yet provides sufficient information so that all transactions are based on definite knowledge of just what is needed and when. It might or might not work equally well in other factories, but the principles on which the system is founded, that all transactions regarding orders and shipment of parts shall be based on definite information obtained with the least amount of labor and expense, are applicable to all plants and will prove advantageous wherever they are recognized.

British India Automotive Imports

ACCORDING to statistics of Indian imports and exports recently published by the Department of Overseas Trade (Great Britain), British India during the year ending March 31, 1925, imported 9380 automobiles valued at Rs. 220 lakhs, as compared with 7984 valued at Rs. 205 lakhs during the previous year. This increase in the imports of cars is said to be chiefly due to a decrease in the prices of British cars, the number of which imported increased from 1005 in 1923 to 1682 in 1924. Canada supplied 3956 cars and the United States 3106, these values differing but slightly from those of previous years, though the Canadian cars imported increased by 666.

The United Kingdom supplied 1201 motorcycles out of a total of 1462 imported into India during the period covered by the report. This compares with 831 British machines imported the previous year. American motorcycles to the number of 228 were imported, as compared with 180 the previous year.

A good idea of the growth of the use of motorbuses, trucks and delivery wagons may be obtained from a study of the figures under these headings in the report. The number of all three classes of vehicles imported during the year was 2156, which is more than double the number imported the previous year. British machines under this classification numbered 100, as compared with 61 the previous year. On the other hand, imports of commercial vehicles from the United States increased from 352 to 782. Rubber tires for vehicles were imported from the United Kingdom, France and the United States to the value of Rs. 29 lakhs, Rs. 25 lakhs and Rs. 10½ lakhs respectively.

With regard to general business conditions in India during the past year the report says the satisfactory financial position revealed by the recently published Indian Budget indicates that the trend of trade is in general upward, but it must not be overlooked that the needs of a large market, normally supplied by the foreign exporter, today remain to a great extent unsatisfied, due to the high prices asked being beyond the purchasing power of the native. For the four great industries of India the past year has been one of mixed results. Jute manufacturing and tea growing companies have in a large majority of cases earned handsome profits, while coal mining and cotton weaving organizations have been faced with a period of extreme difficulty. Consequently, the purchasing power of the country as a whole is still below maximum.

PLATINIZING is a newly introduced process for treating metals to render them unaffected by weather. Iron and steel are said to be made rust-proof, and corrosion is prevented in non-ferrous metals. It is the outcome of several years' experimenting by Platinising, Ltd., of 21 Old Bond Street, Bath. According to the *Motor Trader*, the process consists of depositing an alloy of zinc to form an impervious coating that takes a high and lasting polish. It is not a plating process, for the zinc is said to be incorporated with the basic metal, so that there is no chance of peeling. Platinizing is said to be cheaper than electro-plating, and the color and finish are similar to that secured by silver-plating, without any of its disadvantages. There are two finishes, matt and polished, the former being the cheaper, and ranging in color from silver to dark gray. A high polish is obtained by buffing, giving a color whiter than nickel.

LOCKS—

Coincidental and O

Complex Situation Brough Abo Shall Be Considered Sat in New Agreemen with

By Herbert Chase

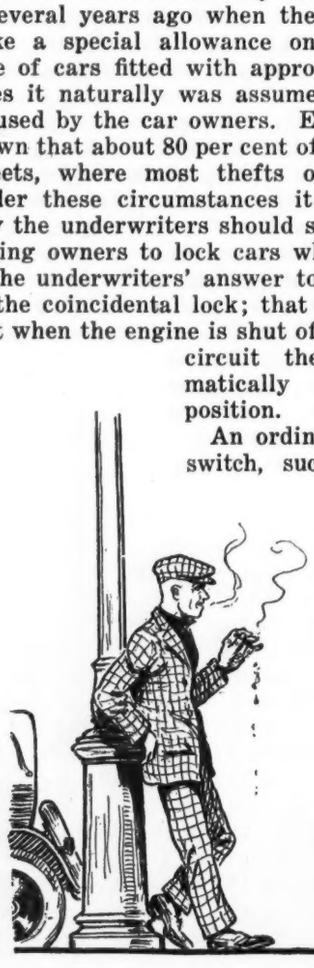
SHALL we have coincidental locks or worry along without them? That is a question which is engaging the attention of a lot of people in the automobile industry today and it is tied up in such an intimate way with a number of other related questions that nobody knows what the answer will be.

It is not our purpose to attempt an answer here, but rather to set forth some of the facts in the situation, so that the reader not already familiar with them can draw such conclusions as these facts seem to justify.

Present approved forms of non-coincidental locks appear to be quite satisfactory—*when they are locked*, or "placed in the theft-resisting position," as the underwriters say. Sad to relate, however, those careless car owners—whose names appear to be legion—and especially those whose cars are covered with ample theft insurance, do forget or neglect to leave their cars locked—and of course an unlocked car is as easily stolen as one without any lock.

Several years ago when the underwriters decided to make a special allowance on theft insurance in the case of cars fitted with approved forms of locking devices it naturally was assumed that such locks would be used by the car owners. Experience is said to have shown that about 80 per cent of cars left standing in city streets, where most thefts occur, are left unlocked. Under these circumstances it is quite understandable why the underwriters should seek some method of compelling owners to lock cars when parked.

The underwriters' answer to this problem appears to be the coincidental lock; that is, a lock of such design that when the engine is shut off by breaking the ignition circuit the lock is placed automatically in the theft-resisting position.



The Coincidental Lock is designed to defeat the automobile careless car owner automatically to lock his machine when he

An ordinary key-operated ignition switch, such as is fitted on many makes of cars today would answer the basic coincidental requirement, but has too few key changes and is too easily defeated in other ways to receive recognition by the underwriters. This fact long has been appreciated and was a most important factor in leading to the use of some form of secondary lock independent of the ignition and placed as a rule either on the gearset or the steering gear.

It is this secondary lock, lacking the coincidental feature, which the underwriters would like to see replaced by an approved lock of the coincidental type. Their experience tables are reported to show that only a small fraction of one per cent of all cars stolen are fitted with an approved form of lock which *is known to have been placed in the theft resisting position* when the car was left unattended.

If we grant the truth of this experience, it is quite apparent why the underwriters are in favor of the coincidental lock and seem likely, when their present agreement with car manufacturers comes to an end the first of next June, at least to cease to give a superior credit in the case of cars with non-coincidental types of lock and possibly to give a superior credit to cars fitted with the coincidental type.

No Conclusion Reached Yet

We are assured that no definite conclusion has been reached to date, either to give superior credit for the coincidental type or to withdraw such credit on types already approved in the non-coincidental class, but there are reasons for believing that such action in respect to both classes is not an unlikely eventuality.

One representative of the underwriters has expressed to us the personal belief that all superior credits for locks of any kind should be withdrawn, but to what extent this belief is held by others is not yet apparent. It is admitted, however, that the basic rate for theft insurance on any car is bound to be determined in part by the character of locking devices fitted and there is reason to believe that, sooner or later, the rate for cars with coincidental locks will be lower than for those with locks of other type, other things being equal.

So much from the underwriters' point of view.

When we look at the matter from the standpoint of the car manufacturer we find that circumstances alter cases,

Otherwise

About by Question of What Satisfactory Car Lock with Underwriters

as might be expected. He is interested in a low insurance rate on his product, for this affects its saleability and the satisfaction of his customers, but he is apparently not entirely sure that the lock problem has been finally solved.

To indicate the line of thought that is being followed by some of the engineers who have been considering this subject we may take the following from a letter recently received from one of them:

> There are many instances where a driver makes a stop of a few minutes without getting out of the car. In such cases, with a coincidental lock, he would be obliged to lock his car in order to stop the motor.
>
> There are many parking places where it is necessary that a car be left unlocked. If no auxiliary switch is fitted by means of which the engine may be stopped without locking the car, the driver would be obliged to leave his engine running or to leave his key with the parking space attendant, neither of which is desirable.

By way of comment on the foregoing, we may say that the first disadvantage seems to us not very serious. We fail to see what difference it makes to the driver whether he turns a switch to shut off the engine or turns a key already in the lock and thereby shuts off the ignition and at the same time locks the car.

In parking places and garages some users find it desirable to leave their cars unlocked, chiefly because those in charge may wish to move the car about and find it easier to do so by starting the engine and driving the car than to push it, let us say, onto or off a wash stand. Where this is required the owner must leave the keys with the attendant or in the lock or leave the engine running, all of which are undesirable, as stated.

It is an advantage of course to be able to move a car in case of fire. Contrary to general belief there are no local ordinances which prevent the use of any approved form of locking device, —a fact established after a careful survey by the underwriters. Many local ordinances do stipulate, however, that cars left in the streets unattended shall be locked, but no approved form of lock prevents moving straight ahead or backward while most types do not prevent pushing the car by hand and turning it at will.

Any lock which is left in the unlocked position increases the theft hazard, though in some cases it is possiblt to hold the persons operating the parking place or garage responsible for safe keeping of the car. A further disadvantage is the possibility that the car will be operated by unauthorized or unskilled persons with likelihood of damage to the car or personal liability of the owner.

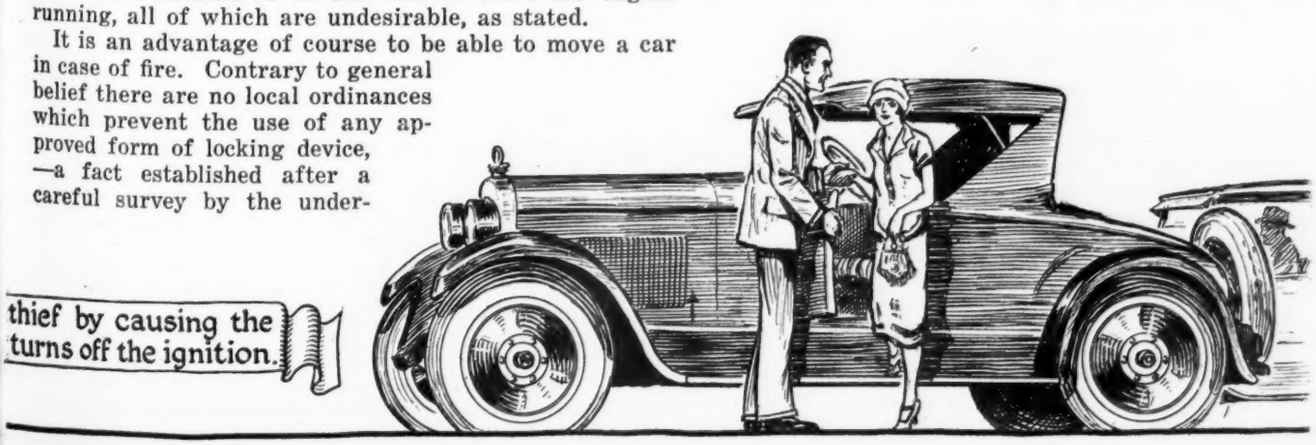
There would seem to be possibilities of overcoming most of the disadvantages that have been cited against this or that type of coincidental lock and it is probable that any which might remain would be more than offset by the advantages gained. In any case the coincidental lock merits the consideration it is receiving and in some quarters more attention than it has received to date.

Other Important Factors

There are other factors, however, which have an important bearing upon the situation. On the one hand there is prospect of superior insurance credit with somewhat decreased sales resistance due to lower insurance rates for cars with approved coincidental locks, while on the other hand there is the matter of costs to be considered. It is claimed by some lock manufacturers that the first costs will be lower or but very little advanced by the use of a coincidental lock in place of an ignition lock and a separate lock for some other part such as the gearset, which is common practice today.

However this may be, the idea of a change in production, preceded by a period of experiment and followed by a campaign of education and trial in the hands of users, is not sought after eagerly by car manufacturers, to put the matter mildly. Unforseen circumstances always may arise to make more difficult and expensive a change which seems simple and profitable. For these reasons there is an understandable general tendency to avoid changes which are not imperative.

Beyond this car manufacturers, and, we believe the underwriters as well, always have contended with good reason that the surest way to stop car thefts is to make resale so difficult that the game is not worth the candle. To this end the manufacturers have fostered the uni-



thief by causing the
turns off the ignition.

form motor vehicle laws which require that purchasers secure proper title to cars which they buy. Laws making such provisions are in force in many states at the present time and it is expected that similar laws will be passed by all states before many years have elapsed. In this case car thefts will become far less of a problem and insurance rates will be decreased correspondingly.

Lock manufacturers contend that some car makers who are opposing lock changes have taken refuge behind the stand that such locks can be defeated and that no changes should be considered until the condition is overcome. This, of course, is not to be taken too seriously, for the lock has not yet been made, even for a bank vault, which cannot be defeated, given the time, skill and tools required. It is understood, however, that the underwriters in cooperation with lock manufacturers are seeking ways and means for avoiding certain specific defects of locks now approved which have been brought to their notice. These changes will prevent defeat of the lock within the requisite time limit and with ordinary tools, if, indeed such defeat is not precluded already.

Accessibility Is a Factor

An item which militates against the use of approved non-coincidental locks which are quite generally fitted on cars in the medium and high price groups today is the fact that they are none too accessible in some instances and sometimes in addition are difficult to operate. When placed at or near the floor level locks are none too easy to reach or to see at night and not infrequently become hard to turn. Furthermore they involve another operation in addition to shutting off the ignition and frequently the use of a second key.

All of these disadvantages are overcome by use of a coincidental lock, which is placed on or adjacent to the instrument board. A non-coincidental lock can be so made as to be operable from the same position, but if so placed it would seem to be logical as well as economical to combine it with the ignition lock and thus make it coincidental unless, of course, the disadvantages of the coincidental type cited above are considered too serious and not offset by worth while advantages.

Since the saleability of a car is affected to some extent by the theft insurance rate and since a change in lock standards affects the rate on cars which do not comply with the standard, it is most desirable that the car manufacturer have ample notice of a change in standards affecting rates, in order that he may have opportunity to investigate the changed situation and accommodate his product and manufacturing schedule to such alterations as may seem desirable.

A "Gentlemen's Agreement"

These facts have been appreciated by the underwriters and several years ago they entered into a gentlemen's agreement with car manufacturers not to make changes in standards affecting rates without giving a year's notice of such changes. On June 1 of this year, however, the underwriters served the car manufacturers with notice that one year hence, that is on June 2, 1926, they will consider this agreement at an end, the ostensible object being, it is asserted, a free hand in the conduct of their own insurance business.

At present the underwriters within the National Automobile Underwriters Conference, contend that they are at a disadvantage as compared to competitors outside their organization, on account of the fact that they must give a year's notice of changes in standards affecting rates while non-members of the conference need not do so.

Abrogation of this agreement, which is of several years standing, will not simplify matters for the car manufacturer, but make it more necessary than ever that he keep close track of changing conditions in the insurance situation which have an effect upon his business. There is nothing to make it appear that the underwriters contemplate taking a stand which is either arbitrary or unreasonable in these matters.

Standards Altered

While the underwriters have not changed their standards pertaining to locks in such a way as to affect rates for about five years, they have altered these standards quite radically within the past 12 months. A new standard was put into effect on Jan. 1 of this year which provides that all automobile locking devices be classified in two groups, regardless of type. Different types of locking devices—ignition, transmission and steering system—or types not hitherto recognized, are considered on an equal basis under the new standard.

Only locks of the coincidental type can attain a Group I classification. All other approved locks are placed in Group II. At the present time there is no preferential rate in favor of Group I coincidental type lock as compared to Group II non-coincidental type, but the presumption is that, sooner or later, such preferential rate will be put into effect, how soon it is impossible to say at this writing. This may not take the form of a superior credit, such as now is given for an approved lock in either Group I or Group II, but nevertheless will be reflected in the basic rate charged, at least in the case of cars with such locks fitted as standard equipment.

Conditions to Be Met

Conditions which must be met by locks approved in the two respective groups are given in the following quotations from the underwriters' standard which became effective on Jan. 1 of this year:

Group I

To attain a Group I classification, a locking device must, in addition to meeting the requirements for Group II (see below), be so constructed that it is necessary to place the locking mechanism in the locked or theft-resisting position in order to break the ignition circuit of the automobile and must provide methods acceptable to the Laboratories for suitable supervision of installations.

Group II

To attain a Group II classification, an automobile locking device must comply with the following requirements:

a. It must be operable from the driving compartment.
b. It must not consist of removable parts other than a key.
c. If locking cylinder is employed it must be of listed type and pattern.
d. It must be sufficiently durable to last for the expected life of the automobile on which it is installed, without undue wear.
e. It must be of such design that its installation and use on an automobile will not increase the fire or accident hazards.
f. It must withstand attempts to defeat its purpose for a period of at least twenty minutes by a person well informed as to its construction and equipped with tools ordinarily found in a garage.

Just Among Ourselves

When Is a Man Too Fat to Drive?

WHEN is a man too fat to drive an automobile? To the best of our knowledge this question never has been seriously considered in this country, but in Spain it has been figured right down to the pound. Furthermore, it has been written into the new Spanish motor license laws, and if you were applying in Spain for an operator's license and had the misfortune to be not taller than 4 ft. 8¾ in., or, at just that height, to weigh more than 191 lb.—adios! No license, Señor, would you get.

There are other interesting features about this law. The minimum age is 18, the maximum 67. Only those free of a large number of obscure diseases and with perfect hearing and vision can qualify. The permits are granted by health inspectors with yardsticks and scales, and holders less than 40 years of age must come up every ten years for re-examination; those over 40, every five years. Any license holder is bound to present himself for a fresh examination should he have had any illness or accident causing him to remain in bed for more than two weeks and need medical assistance.

Such is the life of a motorist in Spain!

A Returned Traveler with Something to Say

WE do so much crabbing on this page about long-winded speeches, publicity that doesn't say anything and general mistreatment of inoffensive words, that we leap eagerly at an opportunity to praise instead of blame—because after all we aren't so darned hard-boiled as we take pleasure in appearing. This preamble is caused by just having read the statement about foreign sales prospects issued when he returned from Europe last week by M. L. Heminway, the g. m. of the M. & A. M. A. Mr. Heminway very apparently was saying what he thought—not what he thought somebody would like him to think. If Pollyanna tried to pick him up on the boat coming home, he must have given her a well deserved boot over the railing of the poop deck. He assumed normal intelligence on the part of the men in the industry who were going to read what he had to say and stated the situation as he saw it. The statement is valuable as well as interesting reading. As an example of good practice in handling statements of this kind we recommend it.

British Maker Records Progress

"ON September 1 of last year," records the *British Commercial News*, "Morris Motors, Ltd., set out on a program of 40,000 cars—the largest ever contemplated by a British car-making concern. On Friday, June 16, 1925, the last of the 40,000 cars left the Despatch Department at Cowley." These figures indicate an average monthly production of something like 4210 for this British producer during the 9½ month period referred to. While those figures don't sound particularly large to the American used to thinking of quantity production in terms of hundreds of thousands, it is due the achievement of this British maker to recognize the fact that during this 9½ month period he built more vehicles every month than did any one of 30 of the smaller American manufacturers during the whole year of 1924. The progress of foreign manufacturers seems likely to be of more interest to American makers in the future than it has been in the past.

Parts Makers Do Their Own Guessing

PARTS makers are largely dependent, of course, on the plans and orders of vehicle builders in laying out their own manufacturing schedules. Past experience has made a lot of parts men dubious, however, about the excellence of the car maker as a business prophet. Consequently, most parts and accessory makers are studying car buying trends very carefully for themselves and are basing their plans on their own analyses rather than on the volume of orders for original equipment or on the statements about future business made to them by their customers. One important parts company, for example, keeps a man in the field constantly whose sole function is to analyze conditions in the industry, to talk to men of all kinds likely to be cognizant of what is coming and to report his findings to the factory as a basis for planning. There is reason in such work by the parts and accessory branches of the industry. The parts men may not be any better guessers than the car builders, but at least they are assuming full responsibility for their own actions.

Department Stores as Auto Dealers

APPARENTLY we got off on the wrong foot in our issue of July 23, when we said that the Gilchrist Co., one of the largest department stores in Boston, which has just begun to sell Hudson and Essex cars, was the first department store in New England to act as an automobile agent. We have been informed by several correspondents since that time that Brown & Thompson of Hartford, Conn., have been handling Cadillacs for Hartford County, Connecticut, for some years back. The Palm of Priority is hereby transferred. N. G. S.

Present Automobiles Use Only About 5% of Energy in Gasoline

T. A. Boyd, fuel expert, says other 95 per cent either is thrown away entirely or lost in friction. Writes fascinating book for laymen on the mysteries of gasoline.

THE average man's knowledge of gasoline doesn't go far. One may even be an automotive executive and still not know a great deal about the chemical composition or reactions of the fuel which forms the basis of the leading manufacturing industry in the United States. It is something which is just taken for granted; which is pumped into the tank of the car at so much per gallon; which then finds its way into the motor, and which in some mysterious fashion propels us where we want to go.

A few of the more inquisitive may be acquainted with the common dictionary definition: "A volatile inflammable liquid used as a solvent for oils, fats, etc., as a carburetant, and to produce heat and motive power." But this, at the best, is a vague definition and one which falls far short of giving gasoline the prominence and dignity to which it is entitled in view of the vast importance it has come to assume in our social and economic life.

"Water, air, oil and gas," it has been said, are the four great essentials of motor car operation. It might also be said that the same four elements occupy analogous positions of importance in regard to human existence itself—at least what we are pleased to call civilized existence. Water and air, of course, are natural requirements. Oil furnishes the lubricant without which the industry which feeds and clothes and pampers us could not turn. Gasoline supplies the motive power for the most useful transportation unit ever produced by man—the motor vehicle.

For the Non-Technical Man

There are thousands of men working with automobiles and other internal combustion machines who have only a very hazy conception of the properties of gasoline; few of them can satisfactorily explain its actions. There are millions of automobile drivers who know less. As T. A. Boyd, head of the Fuel Section, General Motors Research Corp., remarks, these men have a fair knowledge of automobiles, tires, etc., but their ideas of what gasoline really is, where it comes from, how to use it efficiently, are usually very vague. Therefore Mr. Boyd gives us a book.

Around the simple and prosaic title "Gasoline," he has built a story as romantic and alluring as most novels. And infinitely more valuable. It is written for the man in the street and therefore is not technical, yet at the conclusion the reader has the impression that he has been let into a lot of highly technical secrets—as indeed he has.

Mr. Boyd starts with the drilling of the first oil well at Titusville, Pa., in 1859, and reviews the development of the oil industry from that date. That year petroleum production amounted to about 2,000 barrels; in 1860 to about 500,000 barrels; in 1923 it reached the amazing volume of 735,000,000 barrels—this for the United States alone. And some was imported besides to meet our requirements for gasoline. Last year, for example, about 7,750,000,000 gallons of motor fuel were consumed in the United States, about 500 gallons for each of the 16,000,000 cars in service then. It is estimated that half of this was used by trucks and other commercial vehicles, though these vehicles represented only about 15 per cent of the total number of cars registered. Taking this into account, and making allowance for the fact that somewhat less than 90 per cent of the gasoline consumed is used by motor vehicles, there was left an annual average of around 250 gallons for each automobile, or about five gallons a week.

Composition of Gasoline

The beginning of gasoline, as we all know, is crude oil. The actual oil in this mixture is made up of compounds containing carbon and hydrogen in chemical combination. These elements are represented by minute molecules, which vary in size, Mr. Boyd tells us, in somewhat the same manner as unscreened coal is composed of everything from dust to lumps. Over a thousand times a million molecules of the average size found in petroleum could be placed on the point of a pin. If a single drop of crude oil could be magnified to the size of the earth, one of its larger molecules would be about the size of a baseball.

Such a molecule as would, under the conditions mentioned above, magnify to the size of a baseball, would not make a good motor fuel; it would be too large. It is the smaller and lighter particles of petroleum which, after they have been separated and refined, we call gasoline.

Methods of Extraction

The crude oil is refined by a distilling process. It is boiled. When it reaches the boiling point the smaller molecules, being the most volatile, are vaporized first. This vapor is condensed and becomes gasoline, although it goes through a number of other refining and cleansing processes before it is actually ready to be used as fuel. The molecules that next vaporize become kerosene. The still heavier molecules which come through last form lubricating oil.

Not all of our gasoline comes from petroleum. About 10 per cent of the present supply is obtained from natural gas. This is called natural gasoline. Another source of gasoline has been developed with the "cracking" process, which means the breaking up of the large molecules in heavy oils into smaller molecules—small and volatile enough to serve as motor fuel. This is done by bringing the oil to a high temperature under pressure. The product bought at the gas station is usually a care-

fully graded mixture of distilled gasoline, natural gasoline and cracked gasoline. Without the cracking process it is doubtful if enough gasoline could be derived from the present supply of petroleum to keep all the automobiles in operation.

How the energy contained in the gasoline is converted into motive power is interestingly explained, also the nature of the ingredients that come out through the exhaust and what causes "knocks." The product of the exhaust can be found at any soda fountain, for when gasoline is properly burned it produces water and carbon dioxide—seltzer water. About a gallon of water is thrown out for every gallon of gasoline consumed, and many times as much carbon dioxide as would be required to carbonate that much water.

The constituents of gasoline are hydrogen, the gas that is commonly used for inflating balloons, and carbon,

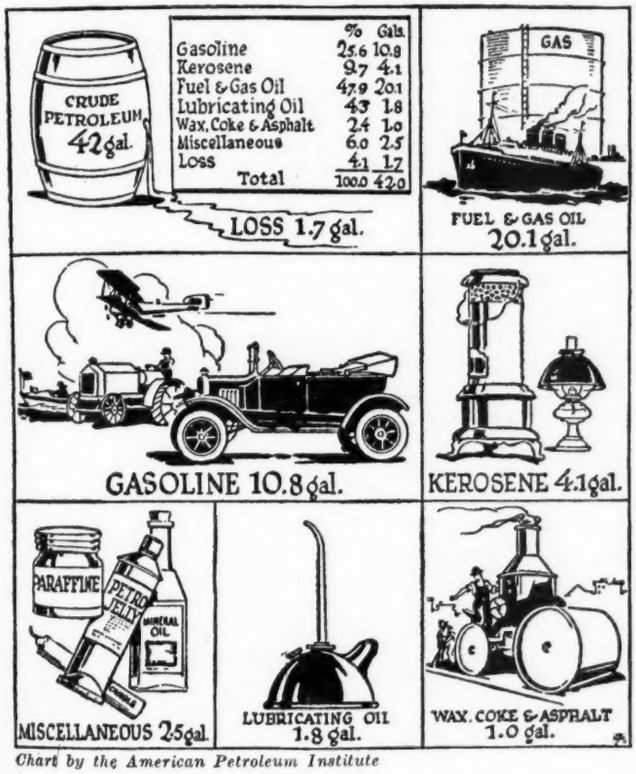


Chart by the American Petroleum Institute

ON the average, every barrel of crude oil produces 10.8 gal of gasoline. But the refiner doesn't stop there. He has found a way to make something out of the whole barrel. The division given in this chart represents the average of all the oil refined; not that made at any one refinery.

the solid substance of which different forms are seen in the diamond, and in coal. The energy of this combination is enormous. It is the generation of this energy during combustion that has made the automobile engine possible. The minute molecules that make up gasoline are always in motion. When they are subjected to heat their motion increases.

On the downward stroke of the engine piston a charge of gasoline and air is drawn into the cylinder. Next comes the compression stroke. This compression does more than crowd the little molecules closer together; the gas also gets hot, which is just another way of saying that the rate at which its molecules move about becomes much faster. The net result is that the piston top and cylinder walls undergo a terrific bombardment. Then the charge of gas is ignited. As it burns the temperature is raised to a very high value; that is to say, the speed of the molecules is enormously increased. The number of collisions with the piston top increases correspondingly and the piston is forced down as if by a giant hand, thereby turning the crankshaft and propelling the car.

A six-cylinder engine, running 40 miles an hour builds six thousand of these gasoline fires every minute.

Mr. Boyd points out that the engine doesn't "knock"; it is the gasoline. Pure benzol does not knock in any engine we know about. Neither does alcohol. If the mixture of gasoline and air in the engine cylinders is squeezed into too small a space, the imprisoned molecules protest with such a deafening din that a knock is produced. The hammering action becomes so terrific that the power and fuel economy of the engine are decreased. The efficiency of the automobile engine might be materially increased with this knocking action eliminated, in other words, if engines of higher compression could be built. But as long as present grades of gasoline must serve our fuel requirements it is difficult to remedy the situation.

Present types of automobile engines are able to utilize less than five per cent of the tremendous energy stored in gasoline. The other 95 per cent is either thrown away entirely or used up in friction. If the efficiency of the motor could be increased therefore, so as to get more energy from the same quantity of gasoline, there would be less apprehension concerning the possibilities of fuel shortages in years to come. For instance, Mr. Boyd says: "By lowering this loss from 95 to 90 per cent, only a five per cent reduction, the number of automobile miles per gallon would actually be doubled. Certainly this does not appear to be out of the range of possibility."

Anti-Knock Fuels Praised

Mr. Boyd sees much good in the development of anti-knock fuels. He thinks they will eventually enable the engineer to build more efficient engines. He mentions Ethyl gas, which "consists of commercial automobile gasoline to which has been added a small fraction of one per cent of a synthetic oil containing a metallic ingredient." Continuing, he says: "Although this compound is present in the fuel in an extremely small amount, yet it controls the way the fuel burns in such a way that the conditions which cause the knock are eliminated. In other words, this material is a combustion governor."

The book is published by the Frederick A. Stokes Co., New York, and is dedicated to Charles F. Kettering, "pioneer in the scientific study of motor fuels and their relation to automotive engines."

The technical men in the automobile industry, especially those concerned with engine design, which presupposes a knowledge of fuels, probably will not get much that is strictly new from the volume, but even they will find it interesting. It was not for men of this class, however, that the book was written. It was inspired by a desire on the part of the author to give the motorist, the "little fellow" in the automobile business, the attendant who turns the pump at the filling station, motor car salesmen, and others, an insight into the true properties of gasoline and a better appreciation of the great value of the commonplace material which they use or handle daily but of which they know so little. To this end there is a chapter of suggestions for the motorist on ways of handling a car in order to get more miles per gallon and a chapter on the dangers of gasoline, both from handling it as a material and from the deadly carbon monoxide fumes it sometimes generates. There is also a chapter on future sources of supply and the ability of the supply to meet the increasing demand.

Books for the Business Bookshelf

High-Speed Engine Tests

TESTING of high speed internal combustion engines has many ramifications and those about to engage in it no doubt often feel the need for a handbook outlining the methods employed in the different tests, describing the various types of apparatus available and explaining the steps taken in calculating desired values from test results. Such a book, from the pen of Arthur W. Judge, has just been published in England and is handled in this country by D. Van Nostrand Co., New York.

In the first chapter the author deals with general principles, classifying the different tests that are or can be made, listing the factors involved and the variables to be considered in such tests, and discussing the effects of such factors as the properties of the fuel used, of the compression, the volumetric efficiency, the temperature of the cylinder walls, etc. The reader is thus given the necessary grounding in the principles which determine the relationship between factors which are measured in the tests. Ricardo's variable compression engine is described and his proposed standard of attainable ideal efficiencies is reprinted and discussed.

The second chapter is devoted to test procedure and outlines the methods usually followed in making engine tests, stating the engine data which it is usual to note down before such a test is begun. The S. A. E. standard test sheets are given, as well as the Air Ministry's requirements in connection with tests of aircraft engines.

Fuel tests and exhaust gas analysis follow, and under this heading a very extensive line of apparatus is described, mostly of English origin, of course. Most of the remaining chapters are devoted to methods and apparatus used in one particular kind of test or measurement, such as measurement of air flow, of water flow and water temperature, of brake horse power, of gas pressure, of gas temperature, etc. This orderly arrangement of the text matter is one of the strong features of the book.

While the bulk of the book deals with engine tests—the subject covered by the title—there are also chapters on automobile tests (covering road tests carried out in the ordinary way and with the aid of accelerometers and drawbars, and chassis dynamometer tests), aircraft engine tests and analysis of high frequency movements.

The author in his preface asks his readers that they point out to him any errors which they may discover, and, in compliance with this request, we wish to point out the following:

On page 14 the following relation is given for the thermal efficiency and fuel consumption for modern automobile engines using gasoline and normal compression ratios—

T.E. = 50 — k.C per cent,

where C = fuel used per I.H.P.-hour in lb., and k is a constant whose value varies between 40 and 45.

According to this formula, if the fuel consumption were nothing at all the thermal efficiency would be only 50 per cent, which does not seem logical; likewise, if the consumption were at the rate of over 1.11 lb. p. I.H.P. hour the thermal efficiency would be zero. This also does not seem to be quite logical and there must be something wrong with the formula.

On the same page the statement occurs that "the T.E. increases with the engine speed up to the most economical speed." As efficiency and economy as used in this connection are synonymous terms, this is self-evident.

In the next paragraph the statement is made that "The fuel consumption of a partly throttled engine is, therefore, greater than when it is working at full throttle." Apart from the poor construction of the sentence it would have been much better to have used the term "specific fuel consumption," as the absolute fuel consumption per unit of time certainly decreases if the engine is throttled, no matter what the nature of the load.

On page 24 it is stated that Fig. 8 illustrates the mechanical efficiencies of a petrol and gas Diesel engine. A gas Diesel is an unknown type of engine and the diagram actually shows three curves, for petrol, gas and Diesel engines respectively. A more careful reading of proofs is to be recommended for any new edition.

1924 Commerce Yearbook

IT would be hard to find a larger assortment of useful business information than is offered by the Department of Commerce in the 1924 Commerce Yearbook, which has just made its appearance. This is the third year that such a work has been compiled from the vast store of business data to which the Department of Commerce has access. In the present issue more ground has been covered, charts and maps have been used freely to illustrate the text, and the reviews, statistics and surveys are more comprehensive, so that no good reason can be found to dispute the claim of the compilers that the volume presents a graphic picture of the world's industry and commerce for 1924, with special reference to the United States.

Some of the interesting features of the book are a foreword by Herbert Hoover, in which he reviews the economic situation during 1924 and finds it satisfactory; an analysis of the results of the last census of manufacturers, which has just become available; a survey of industrial and agricultural production, with considerable space devoted to the automotive industry; a record of wholesale and retail prices; detailed discussion of finance, banking and the security markets; a thorough review of building and construction operations; essential data on transportation and communication; a comprehensive survey and analysis of the foreign trade of the United States, and résumés of economic developments in the principal foreign countries. The volume consists of 718 pages, is well printed and durably bound and was prepared by the Bureau of Foreign and Domestic Commerce, under the direction of Julius Klein. Copies may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., for $1.

Management's Handbook in German

THE Ronald Press Co. announces that "Management's Handbook" is being translated into German by the Verein Deutscher Ingenieure, the great German engineering society. It is understood that this is the first American engineering handbook ever to be published in the German language.

Milwaukee Millers Have Power Rapid Traverse and Motor-in-Base Drive

Multiple disk friction clutch, adjustable starting lever, centralized oiling and independent table feed control are other features.

SEVERAL new features have been added to the line of Milwaukee Milling Machines manufactured by Kearney & Trecker Corp. of Milwaukee. These include power rapid traverse to the table, multiple disk friction clutch, adjustable starting lever, centralized oiling for saddle and table and independent table feed control.

Power rapid traverse to the table is controlled by a long lever on the right-hand side of the knee. Raising this lever causes the table to travel at the rate of 100 ft. per minute in the same direction in which the table power feed is engaged. Release of the lever causes normal speed to be resumed.

The new clutch is designed to work continuously under full load and to give smooth and positive operation.

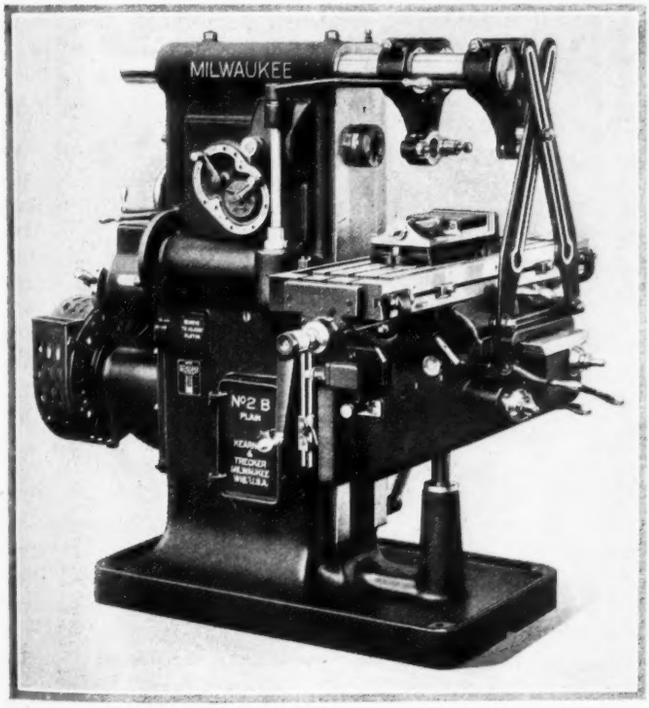


Fig. 1—Improved Milwaukee milling machine showing adjustable starting lever, table feed control lever and end of power rapid traverse lever

The disks are amply separated when disengaged. A cone type brake is provided for quickly stopping the spindle. No tools are required for adjusting; a pin adjustment makes possible a quick adjustment that is uniform over the entire frictional area.

The adjustable starting lever which operates the friction clutch extends to the front of the machine on the left side of the double over arm. It may be adjusted to any angle or swung out of the way to accommodate large work.

Centralized table feed control is accomplished by a single lever at the front of the table which engages the automatic longitudinal feed in a direction determined by the lever movement. This action is independent of either the cross or vertical feeds.

At the front of the saddle on the right-hand side is an oil reservoir fitted with tubing which leads to all the

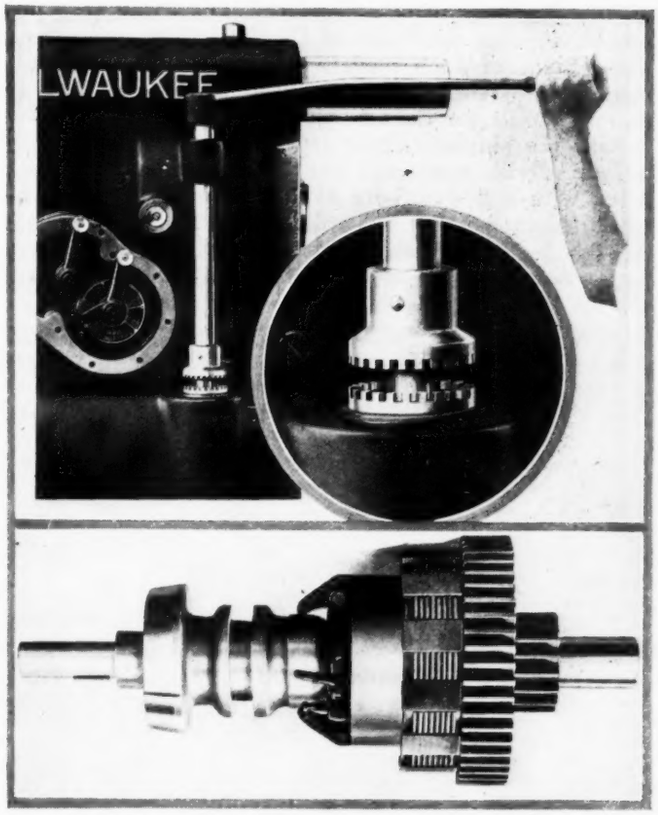


Fig. 2—Upper left, operation of adjustable starting lever. Upper right, detail of adjusting parts. Below, newly designed multiple disk clutch

important wearing surfaces in the table and saddle. This new feature, together with the automatic flooded lubrication for all gears and bearings inside the column, concentrates practically the entire oiling at but two filling points.

In addition to these new features, all models and sizes of Kearney & Trecker milling machines Nos. 1 to 4 can now be obtained with inclosed motor-in-base drive.

The changes outlined above are in addition to the development, a short time ago, of a new indexing and locking device, in which the indexing pin is withdrawn by the locking lever as the latter is released. Under the reverse condition, when the fixture is swung around the index pin drops in automatically. Then the locking lever is manipulated separately.

Harley Davidson Adds Single-Cylinder Models to Motorcycle Line

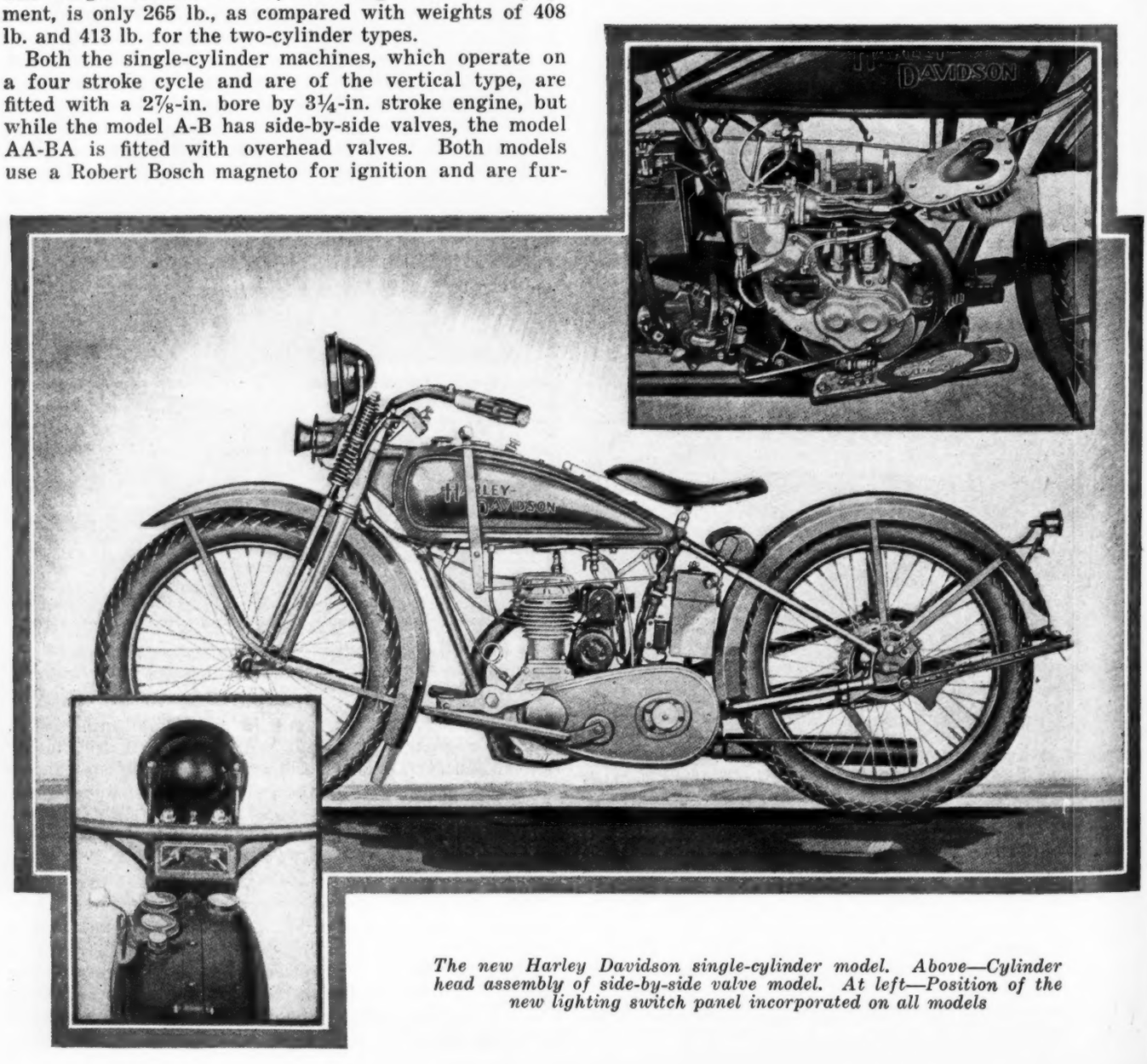
New light-weight machines priced at $210 and $250. Side-by-side valves in one model, overhead type in other. Balloon tires used.

By Athel F. Denham

IMPROVEMENTS in the two-cylinder machines and the addition of two single-cylinder models are the features of the 1926 line of Harley Davidson motorcycles. Prices on the two-cylinder jobs are the same as those on the 1925 models, the light and heavy job listing at $315 and $335 respectively, as before.

The single-cylinder models, designated as the A-B and the AA-BA, are listed at $210 and $250 respectively. The weight of each model, including electrical equipment, is only 265 lb., as compared with weights of 408 lb. and 413 lb. for the two-cylinder types.

Both the single-cylinder machines, which operate on a four stroke cycle and are of the vertical type, are fitted with a 2⅞-in. bore by 3¼-in. stroke engine, but while the model A-B has side-by-side valves, the model AA-BA is fitted with overhead valves. Both models use a Robert Bosch magneto for ignition and are furnished with battery and electric lighting equipment at $25 extra. The electrical equipment optional at extra cost consists of a Harley-Davidson generator, coils and timer, four-plate storage battery, vibrator horn, two bulb headlights, standard tail lamp, and ignition and light switch panel located back of the steering head. A relay cut-out that automatically opens and closes battery-generator circuit is also supplied.



The new Harley Davidson single-cylinder model. Above—Cylinder head assembly of side-by-side valve model. At left—Position of the new lighting switch panel incorporated on all models

Both single-cylinder models are built on a 55-in. wheel base with a loop type frame and helical type front springs. While foot operated external brakes form standard equipment, hand operated brakes can also be supplied at additional cost. The engine to gearset reduction is the same on both models, being 2.77 to 1, but the transmission ratios in the gearset are higher in the side-by-side valve model, as shown below:

	Model A-B	Model AA-BA
Low Gear	16.30	14.92
Second	10.10	9.24
High	6.25	5.72

With these ratios high speeds of 50 miles per hour on the model A-B and 65 miles per hour on the AA-BA model are obtained. Fuel consumption runs at about 70 to 80 miles per gallon on both models, the three gallon gasoline tank providing a range of about 210 to 240 miles.

Aluminum Pistons in One Model

Cast iron pistons are provided on the side-by-side valve model, and an aluminum alloy piston material is used on the overhead valve model. Lubrication, as in the twin-cylinder models, is by splash. The oil tank on both has a capacity of three quarts. A Schebler carbureter is standard equipment. The clutch on both models, as in the two-cylinder jobs, is of the single plate dry disk type and the final drive is of the chain type. 26 x 3.30 balloon tires are provided, although high pressure pneumatics are optional.

Balloon tires have been adopted also for the first time as standard equipment on the two-cylinder models, the new 27 x 3.85 tires being interchangeable with the 27 x 3½ high pressure pneumatics formerly supplied. These pneumatics can still be furnished if desired on these models.

Sixteen improvements all told have been made on the two-cylinder jobs in bringing out the 1926 models. Aside from the addition of balloon tires as standard equipment, wide front and rear and side car mudguards are supplied. These mudguards are now 7¼ in. wide. Important changes have also been made in the electrical system. The generator capacity has been increased considerably and a larger battery with 100 per cent higher capacity, encased in a pressed steel box, has been added to take care of extreme riding conditions.

Larger Armature Brushes

The generator armature is wound with heavier wire, improved box type of brush holders, using brushes with larger face areas, having also been added. A switch panel for ignition and lights has been located within easy reach just back of the steering head. A relay cut-out automatically opens and closes battery-generator circuit. Ignition and lighting switches have been made damage proof, each switch being also key-locked. A push type horn button that makes positive contact and makes the horn easier to operate has also been added.

A new type of actuating mechanism for the foot controlled dry plate clutch has been incorporated. The new mechanism uses fewer parts and makes for smoother operation. The clutch pull rod bearing is now encased and has been made oil-tight to keep it free from dirt.

Spokes and nipples are now subjected to a special plating process which is said to make them rust-proof. Axle clip studs for sidebar connections have also been improved. They have been made much stronger and are now anchored with a lock-nut. The sidecar check straps have been redesigned to provide stability of the sidecar when driving without a passenger.

The muffler cut-out has been changed so as to deflect gases and sound away from the rider and sidecar passenger and a number of minor improvements to increase facility of maintenance such as re-allocating the filler holes in the front end of the gearbox to make them more accessible, have been made.

Endurance of Non-Ferrous Metals

R. R. MOORE, chief of the Testing Branch, Material Section, Engineering Division, Air Service, McCook Field, in a paper presented at the annual meeting of the American Society for Testing Materials gave results of some fatigue tests on non-ferrous metals which he had carried out. The metals tested included naval brass, rolled aluminum, extruded magnesium, and a magnesium-aluminum alloy. The following conclusions were drawn from the results obtained:

1. The ratio of endurance limit to proportional limit and tensile strength for non-ferrous metals is quite erratic.
2. On a weight basis some light alloys are more efficient as regards endurance properties than either cold-rolled plain carbon or alloy steels but not as efficient as some heat-treated alloy steels.
3. The light alloys do not appear to respond to "coaxing" as readily as do the steels.
4. The magnesium-aluminum alloy "as cast" gives a relatively high endurance limit compared to that of the same metal forged.
5. The reduction of endurance limit due to concentrated stresses caused by a notch is not as severe on the cast light alloy as on the forged light alloy. Specimens of pure magnesium and aluminum are affected more than the alloy of both. The notch effect seems to be independent of elongation.
6. Long-time tests (600,000,000 reversals) indicate that some extruded magnesium-aluminum alloys have a definite endurance limit.
7. Designers should know the values for the endurance limits of non-ferrous metals when these metals are to be used as primary members, for the endurance limit is often found to be very low.

Alcohol as Gas Engine Fuel

THE Bureau of Standards terms as erroneous statements made recently that a high-compression ratio is necessary in alcohol as a fuel for internal-combustion engines.

"That this is not true," says the statement, "is fortunate, as manufacturers would be very loth to alter their engines in such fashion as to render them unsuitable for operation with gasoline.

"The fact is that alcohol permits, but does not require, the employment of a much higher compression ratio than gasoline. Should alcohol or other fuels of equal anti-knock value become generally available, compression ratios could be increased, and as a consequence higher efficiencies could be attained. In the meantime the chief advantage to be derived from the use of an anti-knock fuel is that it permits satisfactory operation with an engine too badly carbonized for satisfactory operation with gasoline.

"The use of alcohol does require larger metering jets or a larger needle valve opening in the carbureter. This is necessary both for the reason that alcohol is more viscous than gasoline and because a much richer mixture of alcohol and air is required for complete combustion than of gasoline and air. Fortunately this change can be made ordinarily with little difficulty."

THE FORUM

The Balloon Tire Patent Is Discussed

Editor, AUTOMOTIVE INDUSTRIES:

In the Forum, July 30, Harry E. Dey seems at a loss to know why patent No. 1,537,879 was issued to Alden L. Putnam, in view of the prior state of the art. If Mr. Dey will read the Commissioner's decision reported in the official Patent Office Gazette of May 26, 1925, I think his doubt will be dispelled.

The purpose of the Patent Law is to reward those who add something new and useful to the world's sum total of knowledge as expressed in things that make life more tolerable—to those who first give to the world the things that differentiate our highly developed civilization from barbarism. Had there been no invention, New York would still be a wilderness of wild beasts and London would still be a big bog alive with croaking frogs.

Five Million Patents

Solomon said there was "nothing new under the sun," and yet since then five million patents have been granted by all the nations of the world. Many of these have been granted to the same individuals and by many different governments, so that it is probable that in all the history of civilization only about four million new and useful inventions have been originated, and only one person in every thirty thousand has but a single new and original thought that can be translated into patentable things. Therefore inventors are a peculiar people and the most valuable and least appreciated asset of any nation, as evidenced by the fact that the most prosperous nations are those having the most inventors. Up to 1870 only 400,000 patents had been granted by all nations and 120,000 of them were granted by the United States.

Of the 5,000,000 patents granted up to June 1, 1925, 1,500,000 were granted by the United States, 700,000 by France, 600,000 by Great Britain, 400,000 by Germany, 300,000 by Belgium, 230,000 by Italy 200,000 by Canada and only two in the whole history of Liberia. Thus 90 per cent of the world's progress as measured in new and useful inventions has occurred in the last half century and nearly 50 per cent of the inventions had their birth upon American soil.

Research and Invention

The difference between Mr. Dey's approach to the tire problem and Mr. Putnam's handling of the same problem is the difference between the engineer, the scientist and the research investigator on the one hand and the inventor on the other hand. Research is not synonymous with invention and can never take its place; research but makes more exact and definite our knowledge; invention creates it.

Mr. Dey followed the usual course followed by most engineers. He *sought* a particular tire to suit his particular needs, by attempting to adopt a tire already in use, with slight modifications to be made by others skilled in the art and by the use of knowledge already acquired by *past experience*—mere mechanical skill. He worked exactly as the skilled engineer always works, along well known and hard beaten paths, so often trodden by the hosts that had preceded him; he was sailing on a well and accurately charted sea. So sail most men through life without the thrill of giving birth to a single, new, useful and patentable idea.

The majority of men do not give birth to new thoughts; they do not think, they only remember and gather from books and travel and personal contact what they have read and heard and seen. They collect their thoughts as bric-a-brac gathered from a thousand sources. True, they may sometimes arrange their ideas, ideas borrowed from the past, in new and attractive classifications, but they live in the past and feast upon the husks of thoughts discarded by others. They mix wines of a thousand vintages in old and new bottles, but they plant no vineyards. Their minds toil not in gestation, their hands spin flax already prepared by others, yet Solomon in all his glory was never so brilliant as they in their borrowed wisdom. Not so the inventor; he approaches his problem from behind; he looks always toward the future into a *terra incognito;* he sails an uncharted sea as Columbus did. He begins at the end of the world, where knowledge and experience ends; beyond him there is no beaten path, no light, no compass, no chart—nothing.

Where Invention Begins

It is the function of the Patent Office and of the courts to determine where knowledge and experience ends and where invention begins, and to differentiate between the knowledge of the engineer and the skill of the mechanic, which is based always upon prior experience, and true invention, which is purely a mental excursion into the unknown in an effort to extend the borders of knowledge and to increase the area of the prior state of the art. The work of Mr. Dey was engineering, the work of the tire people was mechanical skill, the work of Mr. Putnam was invention.

Mr. Putnam approached not the problem of the application of a particular tire to a particular vehicle, but he began, *ad initio*, at the end of tire knowledge, to make *better all tires for all vehicles*, to improve the tire *per se*. That he was embarked on a new and uncharted sea is evidenced by the fact that he was ridiculed and told that his scheme was impractical by those who since have been forced to adopt it, and this was the determining factor that proved that it was new, useful and patentable. If Mr. Dey had not been so good an engineer, he probably would have invented the balloon tire. Invention was beckoning to him when he began to doubt that past practice was correct, but the New York expert protested that it did not agree with past experience, and experience is the engineer's guide and experience always looks backward. Mr. Putnam was looking the other way—forward—and deterred neither by criticism nor ridicule; he saw a light beyond the border line of experience and followed

it to success. Ideas *per se* are not patentable, only things accomplished are patentable, something created that lives and moves and has a being. The instant the engineer begins to invent things he loses caste with his profession, because his work is new and can not therefore be based upon past experience and it is therefore not good engineering practice. It creates doubt, protest and ridicule, to all of which the inventor must be deaf. Inventing is a deliciously dangerous act, like flirting with a pugilist's wife; still some men love to flirt even with danger, disaster and death threatening them. Those who succeed should have our unstinted praise; those who try and fail should have our warmest sympathy.

Mr. Putnam has succeeded and has rendered a great service to the automobile owner, to the automobile industry, and it would be a travesty on common justice and equity to withhold from him his hardly earned meed of praise and the monetary reward to which he is fully and fairly entitled.

W. L. DEMPSEY,
Patent Attorney and Consulting Engineer,
St. Louis, Mo.

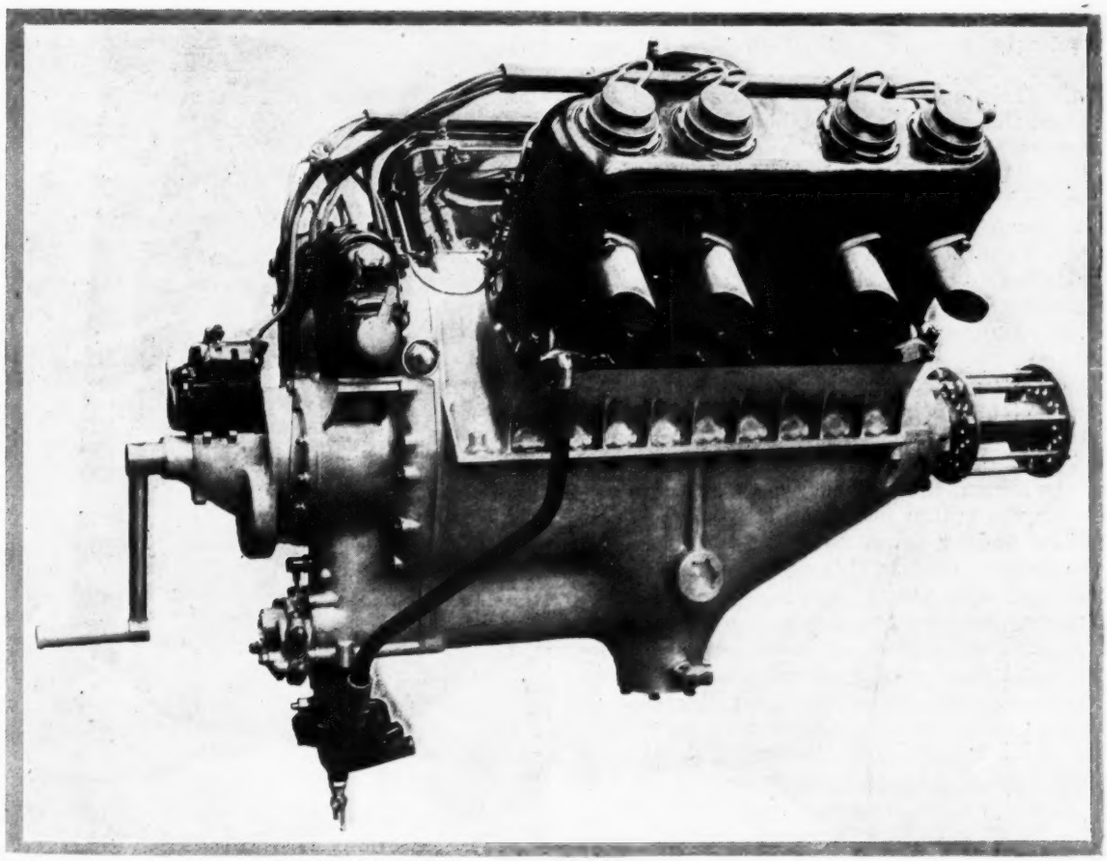
Editor, AUTOMOTIVE INDUSTRIES:

The suggestion made by Robert S. Wentworth in your issue of Aug. 6 interested me because the practice of using flexible header plates on truck type radiators was used by the United States Cartridge Co. as long ago as 1921. At that time the making of replacement cores for trucks was an important portion of the company's business and trouble with the joints between the headers and the core led to the idea of using a very thin upper header plate. So far as I know the suggestion was then original and a patent application was drawn up, although I do not know if it was ever put through as I have not been connected with the company for a considerable length of time.

Of course the cartridge core can be frozen solid without injury, though this does not apply to the tanks unless the latter are specially constructed. In order to test out the flexible header plate idea a Class B truck radiator was placed in sub-zero storage till the tanks burst, which took over two days if memory serves me right. The side pieces of the frame, of course, contracted while the core expanded, but the headers and their junctions with both core and tanks were absolutely unaffected. Our practice as long as I was with the organization was to use a very heavy and rigid bottom header, that carried the whole weight of the core, and I think about a 20 gage top plate. In cases where the headers bolted to cast tanks the thin plate was backed up by steel strips so as to get the proper compression on the gasket.

A. LUDLOW CLAYDEN.

First Knight Sleeve Valve Airplane Engine Ever Built



THIS is a view of the first Knight sleeve valve motor ever built for flying purposes. The engine was built in the plant of Minerva Motors, Belgium, and is a V-8 type with aluminum cylinder blocks and steel sleeves. It has a 4 in. bore and a 6 in. stroke and is rated at 1800 r.p.m. The Minerva engineers are now engaged in the construction of another Knight airplane engine which will have 12 cylinders of 5 in. bore and 7 in. stroke, capable of developing 450 hp.

Leoni Light Electric Vehicle Follows Gasoline Truck Practice

Speed control by commutating battery connections. Drive is through one planetary set from motor to differential and through duplicate planetary sets from differential to rear axle.

A NEW electric commercial vehicle of ¾ ton capacity has been developed by A. M. Leoni of Philadelphia, who was at one time connected with the Steinmetz Electric Vehicle Co. In order to take advantage of the well engineered and economically manufactured products of the parts industry, Mr. Leoni uses for his chassis the same parts as are used in a gasoline type of commercial vehicle of the same total weight, including the frame, spring hangers, springs, hood, dash, fenders, wheels, wheel rims, front axle and steering gear. The two chief elements of the electric power system, the storage battery and the motor, are also of standard make, and the novel features of the new vehicle have to do mainly with the controller and the drive.

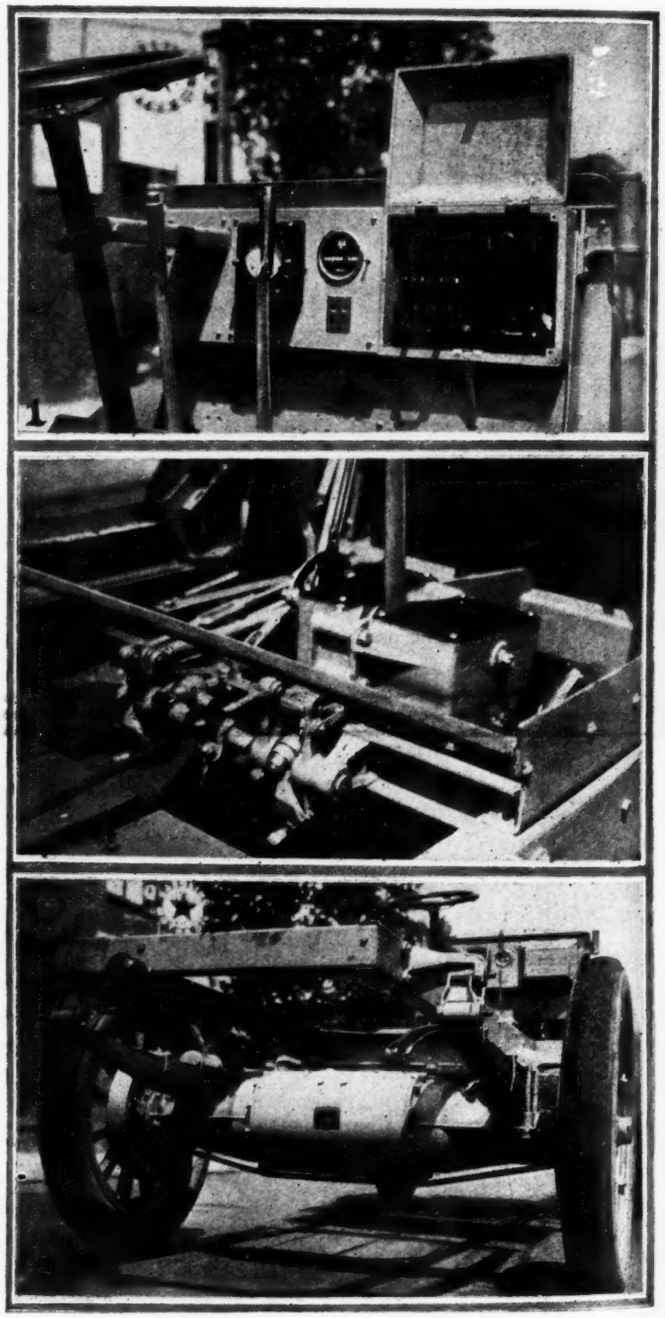
In order to save the brakes and at the same time economize on battery charge, the brakes are interconnected with the controller in such a manner that as the brakes are applied the current is first shut off. The control members are practically the same as used on a gasoline truck. There are the same two pedals and two levers, and in addition there is a foot button corresponding to the accelerator pedal.

The "clutch pedal" of the gas truck operates the controller; the service brake pedal operates the service brake; the gear-shift lever of the car operates a running switch which takes care of the forward, neutral and reverse positions and the bayonet-type of emergency brake lever of the car answers the same purpose.

The accelerator button takes care of selecting the speeds. These are four, on both forward and reverse, though on reverse, usually only the first two are used. The speeds are selected in this manner: By pressing the button the controller is automatically thrown into first speed by the action of a controller spring; by removing the foot from the button, the controller is thrown into second; by pressing the button once more the controller is thrown into third and by again removing the foot from the button the fourth speed is obtained.

The second and the fourth speeds—which are the economical running speeds—are obtained without keeping the foot on the speed button, while the button is compressed on first and third speeds, which are accelerating speeds or resistance positions of the controller used to secure a smoother acceleration of the motor.

The clutch pedal interlocks with the control pedal. For instance, suppose we are running on top speed, and it is desired to slow down on account of traffic conditions; then bring the car to a stop or to speed up again. By pressing the control pedal half way the controller is thrown into second speed, which is a half speed and then, either the control pedal is pressed further to the "no current" position, or the button is pressed once again and the fourth speed is again obtained. The same effect can be obtained by the operation of the service brake pedal in-



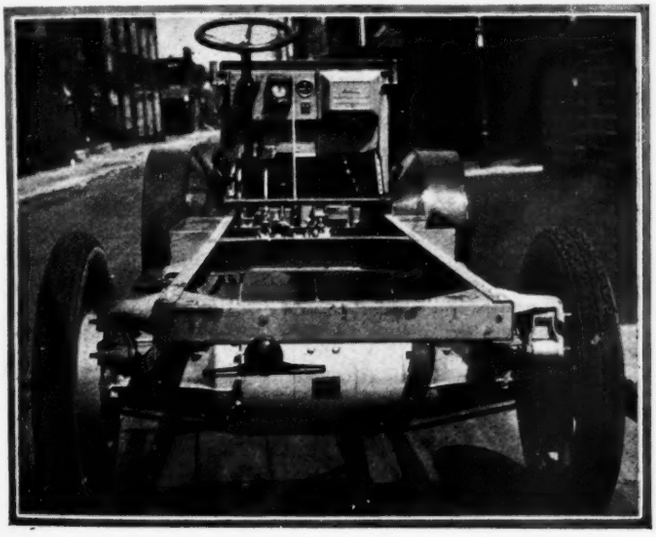
Details of Leoni electric truck. No. 1—Arrangement of control instruments on dash. No. 2—Interconnection of controller and brake gear. No. 3—Showing motor and transmission as a self-contained unit, the motor arranged concentric with axle

stead of the controller pedal, in which case the operator will have his foot ready to apply the brake if the conditions of traffic under which he is operating will make this desirable. In fact, this is the preferred method of driving on crowded city streets, while on open roads, where the slowing down or even the cutting off entirely of the current may be suggested by the desire to save current by coasting, the use of the controller pedal is preferable.

The result is full control of the vehicle by foot operation and saving of current whenever possible, effected automatically when the brakes are applied and at the driver's discretion whenever the possibility of coasting offers itself.

The application of the emergency brake automatically cuts off the current before any braking takes place.

Instead of using field commutation for speed control Mr. Leoni has reverted to battery commutation. The motor has been specially designed for this method of control by the Diehl Mfg. Co. of Elizabeth, N. J., the field windings being of such size of wire that they can be permanently operated connected in series parallel, without overheating. This method of speed control is claimed to result in greater average efficiency and higher main-



Leoni electric truck. Rear view of chassis

tained speed and to help greatly with the commutation, as the relation between armature and field ampere turns remains constant.

The battery is divided into two units which can be connected either in parallel or in series. When the two are connected in series the full electromotive force is impressed upon the motor and full speed is obtained. With the two units in parallel the voltage at the motor terminals is halved, and so, substantially, is the speed. When running at full voltage, since the power obtained with a given current is then substantially twice as great and the losses are dependent upon the current flow, the efficiency is naturally higher.

Commutation of the battery voltage makes it possible to get along with a comparatively small resistance for acceleration, and the losses in the resistance are therefore reduced.

Road tests are said to have shown that it takes only 51 watt-hours per ton-mile to operate the vehicle on level hard roads at a speed of 18 m.p.h. with one-half of the load. Seventy miles were covered on a single battery charge, the battery being the equivalent of a 42-cell 11 plates with a capacity of 150 amp.-hrs.

Motor and transmission are a self-contained unit and since the motor is arranged concentric with the axle the use of bevel gears is obviated. The drive is through a planetary gear of the type in which the internal gear is stationary and the planetaries revolve together with their carrier. Owing to the fact that the motor is of comparatively high speed (2000 r.p.m.) and must be geared down to give a vehicle speed of 16.5 m.p.h., a double reduction planetary drive was adopted, which with a reduction ratio of 12.5:1 and 33-in. tires gives the desired vehicle speed. The two planetary gears are connected in tandem and form a very compact high ratio reduction unit.

Yoke Part of Axle Housing

The yoke or motor frame forms part of the axle housing. The motor is located at the center of the axle. It has a hollow armature shaft mounted on ball bearings. This shaft, through a motor pinion, drives a first reduction gearset, to which the differential is secured and the differential shafts each drive a second reduction gearset (these two forming the final drive) which, in turn, drive the corresponding axle shafts. Ball bearings are used throughout the drive.

All planet pinions are mounted on Hyatt roller bearings. The three gearsets are formed with identical parts, the three internal gears, the three planet carriers and all the planet pinions (two on the first reduction and three on each of the second reduction), together with their shafts or pins, are absolutely identical.

These gearsets, two on the drive side of the motor and one on the commutator side, are carried, concentrically, by individual housings that are bolted to the motor housing, thus forming with it an independent and self-contained sub-assembly, which is completed by the axle tubes. An alloy steel truss-rod strengthens the whole axle unit against load deflections and the unit is completed by standard wheels and wheel hubs.

The gears run in oil baths, formed by the two compartments on each side of the motor plates, and these compartments are provided with filling, draining and level plugs. The filling plugs, naturally the larger of the three, are combined with breathers to prevent the formation of air pressure inside the compartments, under the heat from the gears, which would tend to cause oil seeping into the motor at the shaft-seal of the motor plates.

The motor brushes are rendered accessible by the removal of an inspection band that covers four large inspection ports in the motor frame. In case of motor disassembly, by simply pulling off the two axle housings, the motor and gear sub-assembly is taken off and thus any repair to the motor becomes a bench job.

Surety Deposits to Curb Mishaps

IN the article, "Curbing Accidents by Making Reckless Drivers Financially Responsible," which appeared in AUTOMOTIVE INDUSTRIES of Aug. 6, the author, Herbert L. Towle, was made to appear as saying, in discussing the Swiss plan as it would have to be applied here, that a deposit of $500 should be required of every registered driver. What Mr. Towle said in the manuscript was that the deposit should be required only of violators of the motor laws. The inadvertent omission of a few words changed the meaning of the text and we accordingly make this correction.

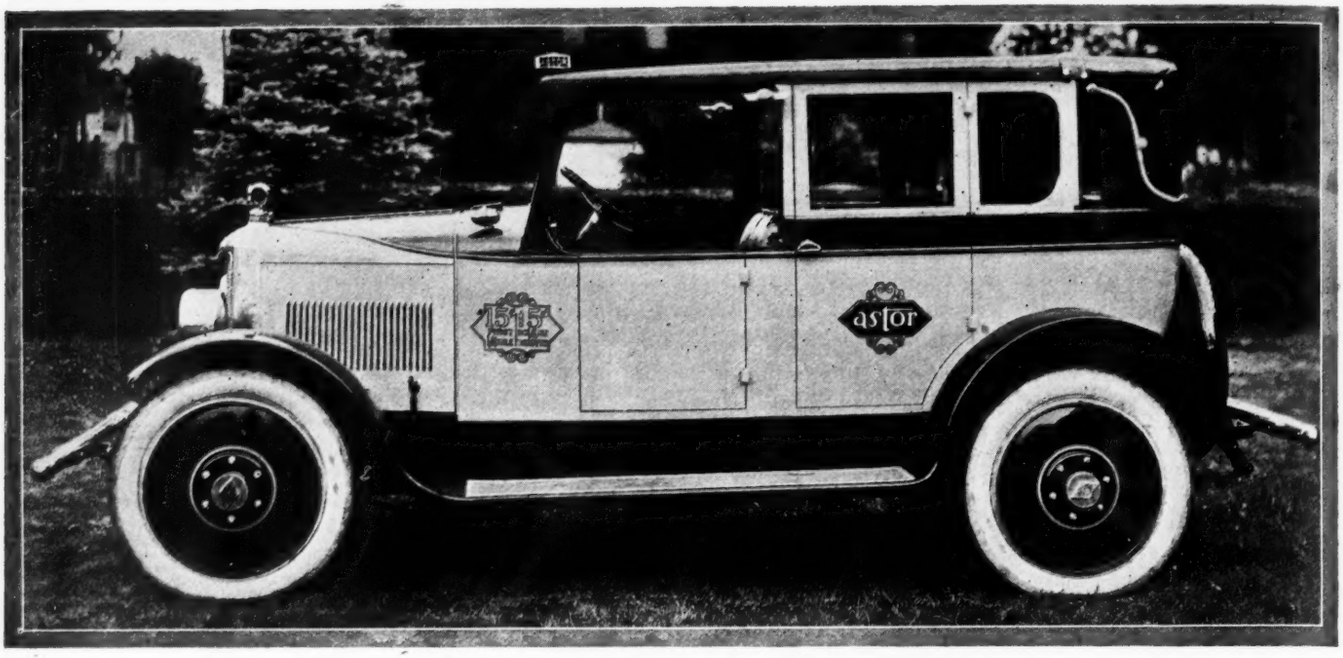
DUE to an error it was stated in AUTOMOTIVE INDUSTRIES of Aug. 13 that the new Buicks were equipped with Mazda 1110 lamps. This is incorrect as Buick is using Tung-Sol Bi-Focal bulbs rated at 21-21 cp.

Exports of Cars, Trucks, Tires and Parts

COUNTRIES	GASOLINE PASSENGER CARS										TRUCKS					
	Up to $500		$500 to $800		$800 to $1200		$1200 to $2000		Over $2000		Up to 1 ton incl.		1 to 2½ tons		Over 2½ tons	
	No.	Value	No.	Value	No.	Va ue	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value
Austria					1	$1,089	1	$1,481								
Azores and Madeira Islands	6	$2,841	1	$722	1	1,008	1	1,829			7	$4,026				
Belgium			68	49,000	60	65,533	19	29,655	5	$16,626	98	38,977				
Bulgaria	4	1,964					1	1,337			2	1,000				
Czechoslovakia					6	6,264										
Denmark			82	61,533	55	56,009	2	3,116	1	3,421	1	1,182	7	$9,645		
Esthonia																
Finland	3	1,175	16	11,329	35	36,889	3	4,614	1	3,150			3	4,082		
France					19	21,110	8	12,398	13	32,500	1	1,319				
Germany	21	4,579	70	55,122	48	53,317	69	104,881	25	61,154	2	2,204	17	22,488		
Gibraltar																
Greece	3	1,473	19	15,131	18	17,815	10	14,518	2	4,652			2	3,936		
Hungary					1	1,008	3	4,116								
Iceland and Faroe Islands					3	2,967										
Italy	557	160,027	2	1,588			4	6,691	2	6,556	692	169,056				
Latvia			2	1,728	6	5,650										
Lithuania																
Malta, Gozo and Cyprus Islands	1	469	1	796												
Netherlands			19	12,174	75	88,024	40	59,092	21	55,002	8	9,867	27	53,662	7	$15,342
Norway	31	14,093	5	3,295	13	13,759	5	7,353	1	2,500	2	2,390	8	12,321	5	9,774
Poland and Danzig	1	561	4	3,300									3	2,457		
Portugal	19	9,270	28	22,255	42	44,473	19	29,174	4	10,000	1	945	2	1,694		
Rumania			4	3,136	18	18,881	13	19,430	2	5,614						
Russia	63	23,105	3	2,044	1	980			1	3,000	163	73,752	1	1,318	3	16,359
Spain	181	64,734	164	131,535	158	162,513	34	52,692	30	85,485	63	32,365	7	8,378		
Sweden	12	5,242	129	97,750	204	206,604	37	55,362	18	49,169	4	3,840	12	13,421		
Switzerland			10	7,625	26	29,406	31	45,764	17	46,529						
Turkey					3	2,610	2	2,564								
United Kingdom	19	8,179	1,146	813,979	168	169,905	585	924,672	129	334,251	68	41,138	35	34,933		
Irish Free State					3	3,227										
Yugoslavia, Albania, etc.	2	866	2	1,262	9	9,196	3	4,116	1	2,632						
United States																
British Honduras	2	616									1	473				
Canada	246	51,731	538	338,452	477	480,517	217	320,615	82	218,793	33	26,777	114	163,471	16	44,593
Costa Rica	2	696	4	2,879	2	2,025										
Guatemala			4	3,354	11	10,949	4	6,188	1	2,156			3	5,347		
Honduras	2	624					3	4,116			2	1,051	1	1,375		
Nicaragua			1	762							1	450				
Panama	6	2,629	10	6,257	16	17,801	7	9,732			10	4,379				
Salvador					23	25,637	13	20,993	1	2,500	1	1,206	1	2,106	3	14,600
Mexico	543	180,610	107	73,388	176	179,804	80	112,893	14	37,692	155	68,366	39	30,184	12	33,735
Miquelon, etc.																
Newfoundland	10	4,618	5	3,720	9	9,145	3	4,667			1	589	1	1,100		
Barbados	1	445					2	3,006								
Jamaica	2	785	5	3,618	7	7,534	4	6,155			1	1,113	1	2,100		
Trinidad and Tobago	5	2,515	1	568	1	1,003										
Other British West Indies	4	1,065	2	1,359	3	2,713	1	1,593			3	1,069				
Cuba	284	94,804	46	32,765	68	66,474	32	44,110	21	56,956	106	27,735	11	13,980	7	24,610
Dominican Republic	61	20,854	4	2,912	6	6,049	5	7,413	1	2,602	21	8,576	1	1,050	2	5,987
Dutch West Indies	1	360			2	2,020	1	1,490			2	705				
French West Indies	9	2,956			1	1,008					2	704				
Haiti	8	3,759			2	2,137	3	4,352			11	4,072	2	2,244	7	11,099
Virgin Islands	1	360														
Argentina	500	220,209	458	341,765	252	271,309	55	99,957	32	86,493	10	9,660	21	32,118	9	24,147
Bolivia			7	5,024	5	5,280	4	5,776	2	5,889	4	3,460				
Brazil	213	65,403	132	107,463	156	158,210	39	57,142	15	43,228	112	29,823	8	12,313	3	9,445
Chile	3	952	35	25,200	3	3,626			2	6,323	72	22,002	21	35,424	7	18,538
Colombia	17	6,710	23	16,725	21	20,711	20	29,471	5	18,033	38	19,699	9	12,321	1	4,999
Ecuador	6	2,040	1	598	3	2,982	6	9,059			6	1,752				
British Guiana					2	1,997										
Dutch Guiana			1	641			1	1,612								
Paraguay																
Peru	21	7,870	6	4,693	24	23,917	6	9,158	7	21,684	51	19,763	36	53,829	4	14,018
Uruguay	177	51,383	25	18,130	11	11,563	7	10,001	6	16,050	100	24,221			3	10,714
Venezuela	87	37,778	15	11,624	31	34,826	8	12,172	1	2,500	30	12,518	12	29,745	1	2,491
Aden																
British India	59	28,268	51	35,650	86	82,087	2	2,938			60	43,419	1	1,901		
Ceylon			20	15,453	10	10,479	2	2,940			7	6,122	10	14,214		
Straits Settlements	15	7,025	24	17,780	18	20,309	6	8,907					2	3,150		
Other British East Indies																
China	44	17,740	67	48,521	66	69,969	13	19,339	3	8,639	31	11,758	16	13,886		
Chosen																
Java and Madura			26	16,560	30	30,021	13	19,389								
Other Dutch East Indies			8	5,013	5	5,022	2	2,960								
French Indo China			4	3,506							5	1,760				
Hejaz, Arabia and Iraq	54	19,148			2	2,155										
Hongkong	10	3,600	3	2,097	5	6,552			1	2,500	12	4,188				
Japan	27	9,506	15	11,769	42	43,743	7	10,166	14	35,049	2	575	4	6,450	1	1,261
Kwangtung			4	3,188	3	3,123							4	4,332		
Palestine and Syria	171	58,811	15	11,001	21	22,067	9	12,881			2	1,329				
Persia	5	1,644														
Philippine Islands	121	44,631	91	73,902	13	12,558	9	13,536	13	38,648	35	17,242	10	13,016	2	3,753
Siam	4	1,960	2	1,703												
Turkey			11	8,826												
Australia	1,739	661,554	1,131	776,714	842	891,885	226	328,228	112	260,761	167	85,610	60	76,900	18	67,119
New Zealand	129	61,468	80	60,077	234	250,153	72	109,937	5	14,089	10	12,885	45	55,529	13	24,450
British Oceania																
French Oceania	2	700	1	650	2	2,200										
Other Oceania																
Belgian Congo			3	2,414	1	1,053					39	12,892	1	1,091		
British West Africa	4	2,111	4	3,173	3	3,281					23	24,035	60	72,225		
British South Africa	49	24,758	366	274,668	291	309,613	32	43,681	2	4,316	18	15,193	9	13,969	1	2,722
British East Africa	39	19,063	4	2,843	18	18,564	5	7,621								
Canary Islands			4	3,405	3	3,086	2	3,140								
Egypt	60	14,160	4	2,969	8	8,336	1	1,334	1	2,500						
Other French Africa	8	2,776	3	2,113							21	7,553				
Italian Africa																
Madagascar																
Morocco	43	16,914	1	672			1	1,522			15	5,948				
Portuguese East Africa	4	1,100	1	763	10	11,850										
Other Portuguese Africa					3	3,412							8	6,636		
Spanish Africa	7	3,333									6	3,000				
Total	5,728	$2,060,620	5,148	$3,682,592	4,001	$4,178,983	1,813	$2,745,908	614	$1,609,622	2,338	$924,830	635	$841,343	125	$363,665

for June, 1925 | Canadian Exports

ELECTRIC VEHICLES		PARTS	TIRES						PASSENGER CARS						TRUCKS		PARTS	COUNTRIES
			Casings		Inners		Solids		Up to $500		$500 to $1000		Over $1000					
No.	Value	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	No.	Value	Value	
		$2,408	120	$2,297	70	$176												Austria
		301																Azores and Madeira Islands
		150,811	606	11,660	524	1,404					2	$1,334	9	$11,275			$9,940	Belgium
		130																Bulgaria
		3,247	415	8,645	234	533	202	$5,235										Czechoslovakia
		467,296	9,503	100,419	9,165	13,873	190	6,359	15	$1,978							28,917	Denmark
		140																Esthonia
		4,233	913	16,108	1,261	2,109												Finland
		482,172	2,176	32,820	1,272	3,170	9	112			2	1,881						France
		60,588	788	11,139	705	1,460			1	406	4	3,007					56	Germany
		167																Gibraltar
		9,640	212	3,642	244	523	84	2,223	20	7,750			5	5,750				Greece
		967																Hungary
		420	122	1,390	214	266												Iceland and Faroe Islands
		91,541	987	11,135	520	849	10	465										Italy
		312	73	1,344	48	141												Latvia
		111																Lithuania
		1,171	116	1,079													567	Malta, Gozo and Cyprus Isls.
15,342		41,580	1,909	31,121	1,094	2,678	10	329					1	1,084			2	Netherlands
9,774		15,384	3,936	51,952	2,201	4,172	76	3,985	11	4,466	1	984						Norway
		4,227	110	1,653	245	382											103	Poland and Danzig
		7,864	453	4,677	767	1,270												Portugal
		716	385	4,825	979	1,766			15	6,353								Rumania
16,359		30,265	66	515	66	94												Russia
		50,867	810	13,152	1,045	2,033	141	3,707										Spain
		45,762	6,266	91,328	3,795	8,484					5	3,160	9	12,205			53	Sweden
		6,500	434	6,432	227	647	12	938			3	2,701					16	Switzerland
		1,460											5	7,759				Turkey
		740,570	11,549	151,776	10,742	13,016	1,698	35,009	1	500	13	11,478	13	19,104	251	$41,999	27,785	United Kingdom
		15,571	25	335	25	130											544	Irish Free State
		1,322	45	443	220	293			12	5,101	1	566					8	Yugoslavia, Albania, etc.
									15	2,459	1	600					59,755	United States
		330																British Honduras
44,503	7	$9,907	1,870,072	600	16,494	1,121	2,949	130	3,507									Canada
			2,394	178	3,567	102	199	4	213	2	780							Costa Rica
			8,072	242	5,234	274	655	4	202									Guatemala
			3,168	125	3,668	134	394	30	1,427									Honduras
			727	20	231	70	127											Nicaragua
			8,379	257	6,099	1,124	1,659	102	2,461									Panama
14,600	13	13,175	4,514	277	5,892	329	1,063	4	187								43	Salvador
33,735			120,974	6,162	70,976	7,034	11,786	147	3,737				11	13,083			1,038	Mexico
			31												2	986		Miquelon, etc.
			2,991	316	3,615	366	663	4	97	10	3,848	1	981				951	Newfoundland
			1,367	11	155	8	15											Barbados
			12,228	100	1,177	29	48	124	1,618	14	5,871						39	Jamaica
			4,694	60	997	31	66			22	7,987				5	1,610	628	Trinidad and Tobago
			6,758	190	1,936	366	572			2	820						108	Other British West Indies
24,610			92,697	3,594	38,425	7,101	13,513	957	23,260				1	1,674			221	Cuba
5,987			14,926	1,326	13,516	2,130	3,166	50	1,783								10	Dominican Republic
			832	75	1,016	252	434			3	1,217							Dutch West Indies
			1,444	163	3,107	138	381	6	95									French West Indies
11,099			4,790	401	3,796	736	1,867			18	5,187	1	978	1	1,113			Haiti
			1,102	34	450	25	38	2	53									Virgin Islands
24,147			247,401	14,707	133,749	7,092	8,736	351	10,530	300	120,580	12	7,957	16	18,736		44,257	Argentina
			8,186	168	3,096	295	606			25	9,766	1	566				24	Bolivia
9,445			1,178,896	8,733	64,875	7,301	9,517	123	3,393	58	23,390	72	60,853	15	18,751		79,236	Brazil
18,538			60,610	797	20,287	152	719	18	596	6	2,258	1	608	2	2,399		290	Chile
4,909			39,392	1,458	24,558	2,783	5,482	60	2,257	7	2,883			4	5,837		32	Colombia
			2,571	136	2,183	28	67	2	110	8	3,120	1	628	7	8,027			Ecuador
			1,459							9	3,828			1	1,089	2	644	7	British Guiana
			54														26	Dutch Guiana
			37															Paraguay
14,018			39,792	1,327	19,242	1,481	2,872	35	1,515	3	1,275	8	6,845	7	8,028			Peru
10,714			25,513	1,128	13,166	1,457	2,800	32	785	54	22,852	14	9,823	8	9,420			Uruguay
2,491			22,449	1,806	25,559	1,712	3,390			52	21,058	2	1,955	3	3,344			Venezuela
			338	80	704	80	115			4	1,674					4	1,288		Aden
			53,208	1,081	11,821	1,179	2,149	87	2,367	619	213,642	33	23,660	1	1,109	135	46,117	50,166	British India
			5,461	137	2,957	42	65	40	1,529	66	24,868	5	4,295					3,619	Ceylon
			22,172	1,376	12,580	50	116	141	2,817	346	119,479	30	24,769	3	3,519	48	15,456	22,765	Straits Settlements
			421															Other British East Indies
			38,575	1,089	11,565	855	1,128	17	296	22	9,420	19	12,059	17	22,874			1,314	China
			72															Chosen
			15,279	3,603	30,745	751	1,660	81	2,139	476	153,972	32	26,171	8	8,691	49	17,393	11,544	Java and Madura
			3,228	25	352													Other Dutch East Indies
			555															French Indo China
			1,864	100	795	170	182			6	2,460	4	3,395				24	Hejaz, Arabia and Iraq
			9,145	267	3,497	352	546											Hongkong
1,261			107,548	12,115	110,076	9,364	13,655	1,222	18,596	42	17,310	37	31,593	14	18,657			1,543	Japan
			410															Kwangtung
			6,826	418	6,925	457	1,906											Palestine and Syria
																		Persia
3,753			45,285	6,068	49,365	8,130	12,447	422	8,920									Philippine Islands
			489	52	575	57	93			21	6,552					24	8,238	5,131	Siam
			831															Turkey
67,119			262,517	5,476	114,728	3,785	9,006	1,261	38,107	1,007	296,133	21	10,594			450	151,048	58,529	Australia
24,459			101,408	3,956	51,397	2,503	4,625	530	19,937	395	133,842	193	143,744	12	14,112	162	55,420	90,329	New Zealand
			192			12	18			2	564			1	1,001	2	833	609	British Oceania
			805			24	241	2	47									French Oceania
			1,006	23	237	12	24			11	4,683								Other Oceania
			2,166							7	2,762								Belgian Congo
			11,320	28	280	5	16			18	5,920	1	584			15	4,830	1,683	British West Africa
2,722			129,176	3,174	38,572	2,387	3,917	149	3,333	289	122,254	7	5,012			26	8,967	4,620	British South Africa
			10,534	25	1,198	10	127			63	24,620	8	4,997			92	34,247	6,910	British East Africa
			17,715	170	2,591	24	32	36	1,146	12	4,568								Canary Islands
			11,766	785	9,442	1,141	1,820	106	1,875	6	2,736							78	Egypt
			2,168	87	1,258	74	148												Other French Africa
			350																Italian Africa
																			Madagascar
			7,839	124	4,033	158	664	6	116	2	834								Morocco
			1,168	54	812	50	80			1	403								Portuguese East Africa
			1,984	69	709	80	103			9	3,799					3	966	14	Other Portuguese Africa
			3,387	42	541	64	121												Spanish Africa
363,665	20	$23,082	$6,903,901	126,934	$1,514,708	111,150	$188,257	8,717	$217,413	4,102	$1,421,219	535	$407,769	174	$218,641	1,269	$386,566	$513,554	Total



A comparatively new arrival in the transportation field—the Astor Cab

Taxicab Has V-Shaped Radiator and Unique Color Combination

The Astor, built by M. P. Moller Motor Co., uses Buda powerplant. Furnished in two models, limousine and landaulet, with disk wheels.

THE Astor taxicab, assembled from standard parts by the M. P. Moller Motor Co., Hagerstown, Md., and marketed by the Astor Cab Sales Co., Inc., of New York, is distinguished chiefly by the radiator design and color scheme.

The power plant is a Buda W.T.U. model equipped with Bosch magneto and Zenith carbureter. A Borg and Beck clutch is used while the transmission is a special design. Lighting and starting systems are of Bosch make and Stewart Warner vacuum gasoline tank is used. Universal joint is Spicer and both front and rear axles are Columbia, full floating. Exide 80 amp. battery is used.

Wheel Base Is 118 In.

The frame is of hydraulic pressed steel eight in. deep and reinforced with three cross members. Ross cam type steering gear is used. Wheels are Budd disk type. Five Goodrich Silvertown 33x4½ Cord tires are standard equipment. Wheel base is 118 in.

The radiator is of the V-front type to provide greater cooling surface and is considerably different in design than that used on any other cab. Either limousine or landaulet type body is available. The limousine is of the dummy landaulet type with the rear quarter entirely covered with leather and the usual landaulet props present. Fenders and running board are pressed steel with the running board riveted direct to the chassis frame. The fenders are formed from 14 gage steel and large over hang in front has been eliminated to lessen possibilities of damage through head-on collisions.

The door uprights and landaulet props are painted a light emerald green separated from the wide belt line of orange by a black beading on which there is a gold stripe carrying a red line. The lower part of the cab is painted a beige color which is also separated from the belt line by the same method as the upper part. The wheels are painted orange to correspond with the belt line, and the top, running board and fenders are black. This makes a rather striking color combination which is not easy to duplicate.

The cab is equipped with roof, pillar, cowl, radiator, stop and head lamps. The roof, pillar, cowl and radiator lamps are of distinctive design with wing like shades which give a soft light effect. Headlights are full drum type in nickel. The front bumper is a solid nickel steel bar and all hub caps are solid nickel. On the dash are the speedometer, starting and lighting switch, and oil gage.

New York delivered price for the limousine is $2295 cash or $2557.80 time, and for the landaulet $2345 cash and $2607.80 time. These prices include finance charges, war tax, fire and theft insurance, delivery expenses and all standard equipment.

CARBON black, which is used as a filler in rubber compounds, paints and many other industrial products, is a fluffy, velvety black material produced by burning natural gas with a restricted air supply against a metal surface. It is, in fact, a species of lampblack, but possesses certain unique and valuable qualities that cannot be claimed for any other substance, and it is therefore increasing in importance as a commercial product.